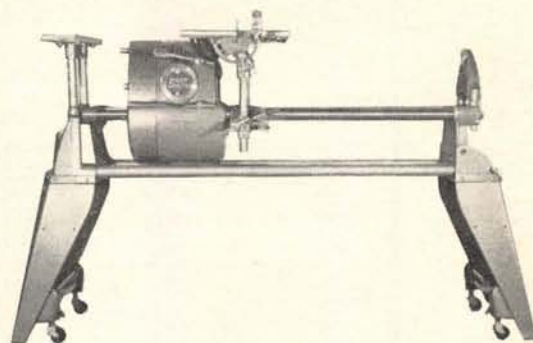
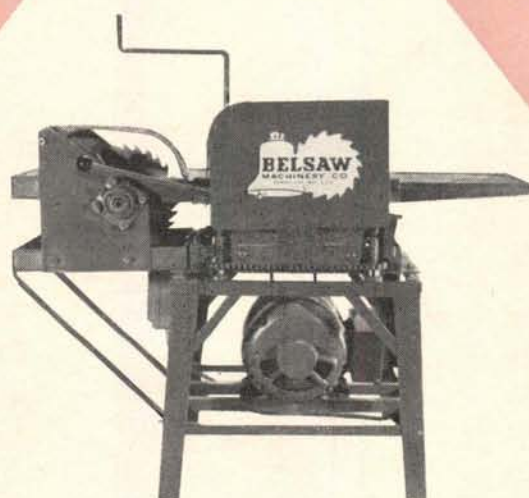
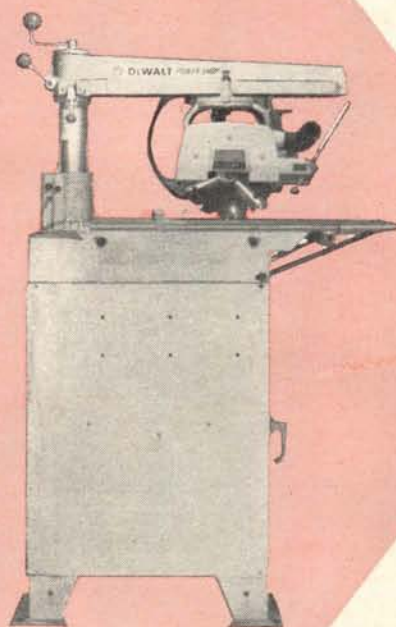


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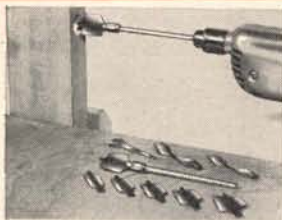
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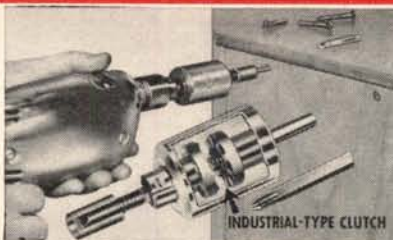
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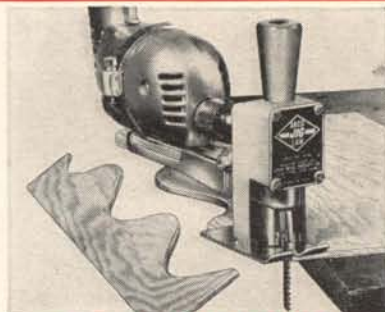
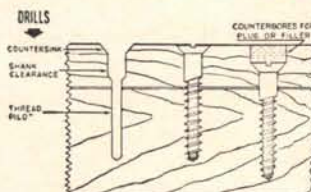
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WORKBENCH volume 17 • number 1

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Fred Stebbins, Photographer

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LETTERS TO THE EDITOR

Dear Mr. Hedden:

When I accidentally cut a 10-ft. steel measuring tape I salvaged it for further use in the following manner: On a length of clear, straight-grained lumber I cut a curved edge on my shaper to match the shape of the rule, then nailed the rule to the curved surface. I now have a 10-ft. "yardstick" and a handy straight-edge as well.

Otto F. Kupke, Haworth, Okla.

Dear Mr. Kupke:

Thanks for the tip on what to do with a broken steel measuring tape. Almost every craftsman will at one time or another end up with a damaged measuring tape that could be utilized in the manner you describe.

Dear Sir:

Have been reading WORKBENCH for some time and like it very much, but somewhere along the line somebody "goofed." In the "Opaque Projector for Larger Copy" there is no size for the base, no length for the box and no size for the door. Also no size for the box that supports the lens tube.

Roy W. Finan, Hancock, N. H.

Dear Mr. Finan:

You caught us with our dimensions missing. The base dimensions were left out, as it can be any size practical, to fit a particular situation. The length of the box is the same as the length of the crosspiece on the tubes, 23½ in. The door is 13 x 13 in., the width not being critical. Length of the box for the lens tube is 3½ in., it is 7½ in. square, or just large enough to accommodate the diameter of the lens tube.

Dear Editor:

Appreciated the pages to cut out with different screw sizes on them. Will you have more of this kind of information in future issues?

Mr. W.R.C., St. Louis, Mo.

Dear Mr. W.R.C.:

We are preparing more pages of this type and they will be in future issues. We are trying to determine what information will be of most interest to readers, and would appreciate hearing from the readers as to what types of material they would like to see on these pages that are placed so that they can be cut out and made into a booklet for the workshop.

Dear Editor:

In the Nov.-Dec. issue you illustrate on page 24 a boy holding a 25-power binocular, personally tested by you. Is it really 25-power? I can't hold a 7-power steady enough to see clearly, let alone 25-power. You probably meant a 5-power, which brings objects to 1/5 actual distance, making them seem 25 times larger in area. A 25-power would give an apparent magnification of 625 times.

Noted on page 46 that you say the Maxaw 737 is rated at 6¾ in. depth of cut. Pretty deep for a hand tool! I used to be a proofreader.

George M. Miller, Silver Spring, Md.

Dear Mr. Miller:

The binoculars are 25 power. With a 50 mm objective lens you get a fairly wide field of vision, and the glasses can be hand-held for a few moments without too much trouble. We found that resting them against a tree, post, or other solid object permitted extensive viewing with no trouble. We too were doubtful of being able to use such powerful glasses, so we made the personal test to be sure.

We did goof on the Maxaw story. The blade size is 6¾ in., depth of cut at 90 deg. is 2½ in., at 45 deg. is 1¾ in. It must have been one of those bad days when errors slip by.

Dear Mr. Hedden:

Our client, Masonite Corp., has called to my attention the article on page 36 of your Sept.-Oct. issue concerning the renewing of a kitchen with floor tile.

The outline with the lower center picture on page 36 mentions that floors should be first covered with sheets of "tempered hardboard" or plywood.

Masonite Corp. does not recommend this particular product for this use. Rather, it suggests the use of Masonite Underlayment, a technical bulletin concerning which is enclosed. Cordially yours, Frank L. Brunckhorst, Account Executive

Dear Mr. Brunckhorst:

Thank you for the information. Yes, the outline should have stated "underlayment," rather than hardboard. Underlayment is a special type of tempered hardboard, designed specifically for use with flooring materials, such as described in the article.

Dear Editor:

A number of our members collect match-box labels as a hobby. Are there any such collectors in the U.S.A.? If so, can you help our members contact some American match-label collectors who are willing to exchange labels?

We shall greatly appreciate your assistance in this matter. Sincerely, The General Secretary, Federated Chamber of Commerce, 133 Mahatma Gandhi Road, Pondicherry, India.

Dear Mr. Secretary:

We are sure there are collectors in the U.S.A. who would like to exchange covers. Readers interested in sending covers overseas should remember that postage to foreign countries is at least double that for domestic mail.

Dear Mr. Hedden:

Am considering putting aluminum siding on my home to eliminate the painting problem. A friend tells me that the baked-on enamel will not last a "lifetime," as the ads say. What is the truth?

R. Johnson, Milwaukee, Wis.

Dear Mr. Johnson:

Manufacturers of the paints, enamels and lacquers used on this type siding deplore such claims, pointing out that no such claims are ever made for automobile finishes, which are better protected from weather by garaging and waxing than aluminum siding. Finishes used on these siding materials will give long service, but "a lifetime," or "forever" is a long, long time.

Gentlemen:

There is a great need for birdhouses, but if they aren't the right size, shape or in the right place most houses will not be occupied by birds. Birdhouse builders should read the excellent book on birdhouses for 25 cents from the Audubon Society, while there is also a good booklet available from the Superintendent of Documents, U. S. Printing Office, Washington 25, D. C., titled "Homes for Birds" that costs just 10 cents. Carl G. Hayson, Hartland, Wis.

Dear Mr. Hayson:

Your advice is excellent. If any readers have unoccupied birdhouses, one of the booklets mentioned probably will explain the reason.

Jay W. Hedden

Jay W. Hedden, Editor



I'd like to give this to my fellow men... while I am still able to help!

I was young once, as you may be—today I am older. Not too old to enjoy the fruits of my work, but older in the sense of being wiser. And once I was poor, desperately poor. Today almost any man can stretch his income to make ends meet. Today, there are few who hunger for bread and shelter. But in my youth I knew the pinch of poverty; the emptiness of hunger; the cold stare of the creditor who would not take excuses for money. Today, all that is past. And behind my city house, my

summer home, my Cadillacs, my Winter-long vacations and my sense of independence—behind all the wealth of cash and deep inner satisfaction that I enjoy—there is one simple secret. It is this secret that I would like to impart to you. If you are satisfied with a humdrum life of service to another master, turn this page now—read no more. If you are interested in a fuller life, free from bosses, free from worries, free from fears, read further. This message may be meant for you.

By Victor B. Mason

I am printing my message in a magazine. It may come to the attention of thousands of eyes. But of all those thousands, only a few will have the vision to understand. Many may read; but of a thousand only you may have the intuition, the sensitivity, to understand that what I am writing may be intended for you—may be the tide that shapes your destiny, which, taken at the crest, carries you to levels of independence beyond the dreams of avarice.

Don't misunderstand me. There is no mysticism in this. I am not speaking of occult things; of innumerable laws of nature that will sweep you to success without effort on your part. That sort of talk is *rubbish*! And anyone who tries to tell you that you can *think* your way to riches without effort is a false friend. I am too much of a realist for that. And I hope you are.

I hope you are the kind of man—if you have read this far—who knows that anything worthwhile has to be *earned*! I hope you have learned that there is no reward without effort. If you have learned this, then you may be ready to take the next step in the development of your karma—you may be ready to learn and use the secret I have to impart.

I Have All The Money I Need

In my own life I have gone beyond the need of money. I have it. I have gone beyond the need of gain. I have two businesses that pay me an income well above any amount I have need for. And, in addition, I have the satisfaction—the deep satisfaction—of knowing that I have put more than three hundred other men in businesses of their own. Since I have no need for money, the greatest satisfaction I get from life, is sharing my secret of personal independence with others—seeing them achieve the same heights of happiness that have come into my own life.

Please don't misunderstand this statement. I am not a philanthropist. I believe that charity is something that no proud man will accept. I have never seen a man who was worth his salt who would accept

something for nothing. I have never met a highly successful man whom the world respected who did not sacrifice something to gain his position. And, unless you are willing to make at least half the effort, I'm not interested in giving you a "leg up" to the achievement of your goal. Frankly, I'm going to charge you something for the secret I give you. Not a lot—but enough to make me believe that you are a little above the fellows who merely "wish" for success and are not willing to sacrifice something to get it.

A Fascinating and Peculiar Business

I have a business that is peculiar—one of my businesses. The unusual thing about it is that it is needed in every little community throughout this country. But it is a business that will never be invaded by the "big fellows". It has to be handled on a local basis. No giant octopus can ever gobble up the whole thing. No big combine is ever going to destroy it. It is essentially a "one man" business that can be operated without outside help. It is a business that is good summer and winter. It is a business that is growing each year. And, it is a business that can be started on an investment so small that it is within the reach of anyone who has a television set. But it has nothing to do with television.

This business has another peculiarity. It can be started at home in spare time. No risk to present job. No risk to present income. And no need to let anyone else know you are "on your own". It can be run as a spare time business for extra money. Or, as it grows to the point where it is paying more than your present salary, it can be expanded into a full time business—overnight. It can give you a sense of personal independence that will free you forever from the fear of lay-off, loss of job, depressions, or economic reverses.

Are You Mechanically Inclined?

While the operation of this business is partly automatic, it won't run itself. If you are to use it as a stepping stone to independence, you must be able to work with your hands, use such tools as hammer and screw driver, and enjoy getting into a pair of blue jeans and rolling up your sleeves. But two hours a day of manual work will keep your "factory" running 24 hours turn-

ing out a product that has a steady and ready sale in every community. A half dollar spent for raw materials can bring you six dollars in cash—six times a day.

In this message I'm not going to try to tell you the entire story. There is not enough space on this page. And, I am not going to ask you to spend a penny now to learn the secret. I'll send you all the information, free. If you are interested in becoming independent, in becoming your own boss, in knowing the sweet fruits of success as I know them, send me your name. That's all. Just your name. I won't ask you for a penny. I'll send you all the information about one of the most fascinating businesses you can imagine. With these facts, you will make your own investigation. You will check up on conditions in your neighborhood. You will weigh and analyze the whole proposition. Then, and then only, if you decide to take the next step, I'll allow you to invest \$15.00. And even then, if you decide that your fifteen dollars has been badly invested I'll return it to you. Don't hesitate to send your name. I have no salesmen. I will merely write you a long letter and send you complete facts about the business I have found to be so successful. After that, you make the decisions.

Does Happiness Hang on Your Decision?

Don't put this off. It may be a coincidence that you are reading these words right now. Or, it may be a matter that is more deeply connected with your destiny than either of us can say. There is only one thing certain: If you have read this far you are interested in the kind of independence I enjoy. And if that is true, then you must take the next step. No coupon on this advertisement. If you don't think enough of your future happiness and prosperity to write your name on a postcard and mail it to me, forget the whole thing. But if you think there is a destiny that shapes men's lives, send your name now. What I send you may convince you of the truth of this proverb. And what I send you will not cost a penny, now or at any other time.

VICTOR B. MASON

1512 Jarvis Ave., Suite M-6-A
CHICAGO 26, ILLINOIS

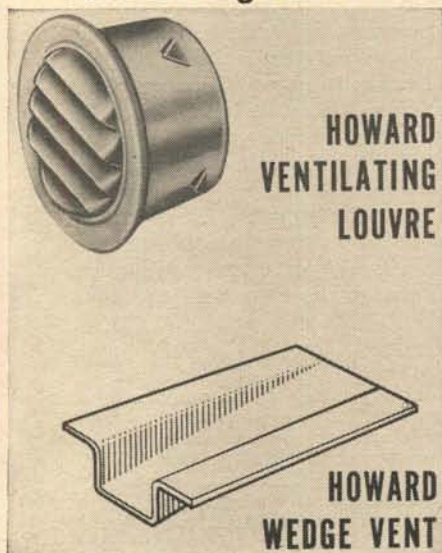
JANUARY-FEBRUARY, 1961 » 5



keeping up with craft and home products

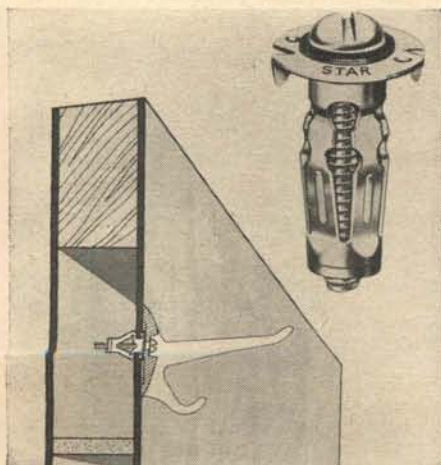
In communicating with companies whose products are described in this department, please mention **WORKBENCH**.

Paint-Saving Louvers



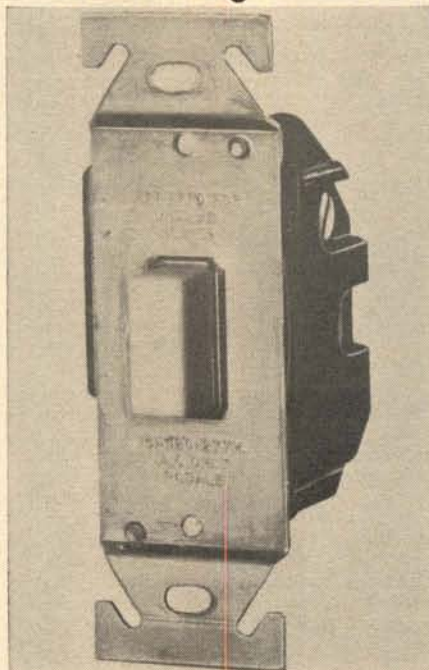
PAINT BLISTERING, caused by trapped moisture inside exterior walls is eliminated by the installation of round louvers through the exterior siding and sheathing. Water vapor thus is vented to the outside. Where problem is just moisture on the back side of lap siding, wedge-shape vents are driven under the lower edges of the boards. Wedge Vents and Ventilating Louvers available at hardware stores or write to Howard Hardware Prod., Inc., Newark, N. J.

Extra-Short Screw Anchor



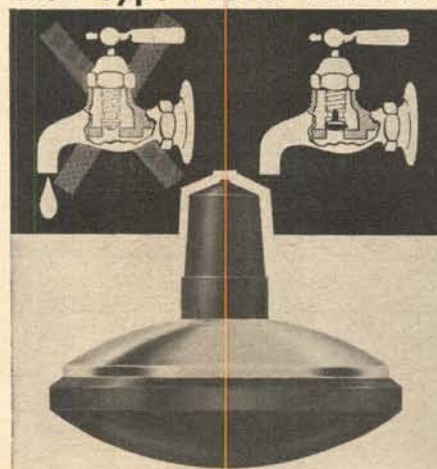
ATTACH FIXTURES to hollow-core doors, thin room dividers, hollow walls with this short screw anchor that will work through surfaces $\frac{1}{4}$ in. thick or less. From hardware stores, or Star Expansion Ind., Mountainville, N. Y.

Low-Cost Light Control



BUDGET-PRICED, and easily installed by a do-it-yourselfer, this switch dims any incandescent lighting system to a soft glow. Replaces regular on-off switch, is wired the same. \$5.95, BC Lighting Mfg. Co., Los Angeles, Calif.

New-Type Faucet Washers



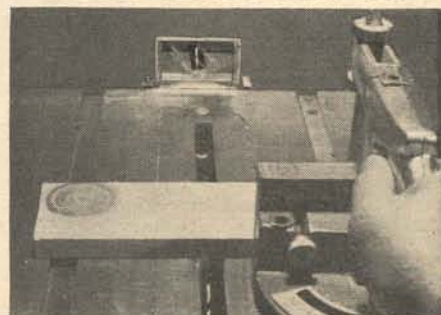
CURVED NEOPRENE FACE of this washer is backed by curved brass washer. Projection of neoprene seal replaces usual screw. Offered on money-back guarantee, two sizes of "Ever-Wear" seals are included in each package, will fit all standard faucets. Four complete sets for \$1.00 from John L. Chaney Instrument Co., Lake Geneva, Wis.

Weatherstripping Kit



SOLID-ALUMINUM EXTRUSION holds an insert of ridged vinyl in this weatherstripping, eliminating usual problem of tearing, rusting, humming in the wind, etc. Kit includes "door shoe" that has integral rain cap that fits under door. Kit can be installed in about one-half hour on usual door, costs \$6.75 at hardware and building-supply stores, or from Pemko Mfg. Co., 5755 Landregan St., Emeryville, Calif.

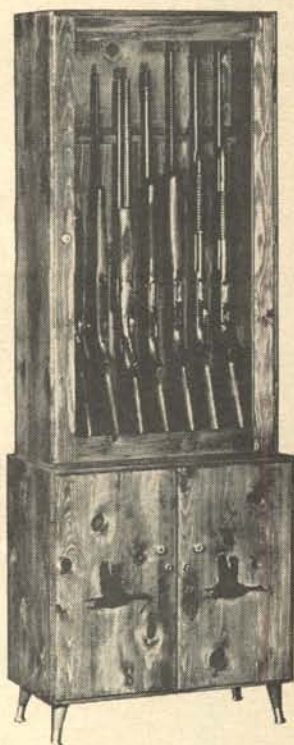
Mirror Shows Saw Cut



HELD BY MAGNETS on back edge of saw table, this accessory shows where saw blade is cutting, eliminates need for dado blade. Mirror pivots down out of way as work passes over it. Steel strip provided for aluminum tables, as they are not magnetic. \$3.95 from Hi-See-Fi, 68 Westminster Rd., Great Neck, N. Y.

**USEFUL!
PRACTICAL!
FUN TO
ASSEMBLE**

KNOCKDOWN KITS THAT ARE KNOCKOUTS FROM GILES & KENDALL

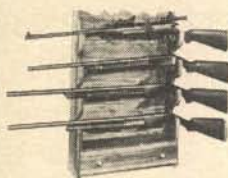


GUN CABINET NO. 707

The knotty pine "Pioneer" gun cabinet holds eight guns. Bottom storage compartments for ammunition and other equipment equipped with two locks. Brass ferrules on legs. Overall size 27" wide, 15½" deep, 83" high. Glass for door not included.

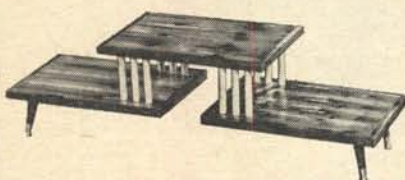
Use the coupon below to get your copy of the Giles & Kendall Company colorful new catalog.

Over 50 items to choose from. All are pre-cut. There's no waste. Hardware included. Easy to follow instructions.



GUN RACK NO. 404

This four gun rack with full width drawer for ammunition and cleaning gear is all cedar. Comes complete, ready to assemble with all screws, brass pulls and safety lock. 32" high, 21½" wide.



COCKTAIL TABLE NO. M-17

Solid cedar. Top is 20" wide, 44" long. Stands 15" high. Complete with all hardware including brass ferrules for legs.



GENUINE CEDAR CHEST NO. 909

The "Astronaut" with simulated drawers and brass pulls has a handsome, modernistic style. Cedar legs have brass ferrules. Size 20" wide, 46½" long, 21" high. Five ply top and front.



LIMED OAK CHEST NO. 999

The "Rocket" limed oak chest has a cleverly designed front of simulated drawers with attractive brass pulls. Modernistic legs with brass ferrules. Size 20" wide, 46½" long, 21" high. Five ply top and front.

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Box M
Huntsville, Alabama

Please send me your new catalog of "do-it-yourself" items of Genuine Tennessee Aromatic Red Cedar and other woods. Enclosed is 25¢ (coin or stamps) to cover mailing and handling. I understand this amount will be credited on my first order.

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INCLUDES
4" DIA. PULLEY
1/2" BORE
9/32" VEE BELT
22" LONG

MAKE YOUR OWN GRINDER!

Merely mount a used appliance motor and grinder on a board and you'll have a LOW COST grinder that will sharpen tools as keenly as much higher priced grinders! Makes honing fast and easy! High grade wheel is 2 1/2" dia. x 1/2" face, 46 grit. Polished and ground steel spindle is 3/8" dia. Pulley, 1/4" dia. Runs 6000 RPM. Tool rest adjusts for wear and angular setting, holds tools at proper angle against wheel. Wheel of 1/8" radius available at 75c extra.

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Amazing **CIRCLE MASTER**, new patented attachment, permits you to cut all circular shapes on any make bench saw. Diameter adjustable up to 30" on small saws, bigger on large saws. Make chairs, table tops, wheels, trays, lazy susans, stools, coasters. Beveled, shoulder, cove, moulding and many other cuts. Completely satisfied or your money back!

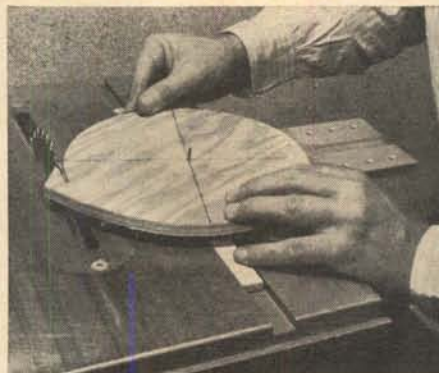
VERDAN DISTRIBUTORS, INC.

570 Thomas Ave.

Rochester 17, N. Y.

Craft and Home Products

Table-Saw Circle Cutter



FITTED ON A TABLE SAW, this accessory permits cutting circles, even coves, shoulders and moldings on circles. Pin centers stock, saw is used to cut off corners, more corners until stock is complete circle. Also can be used on band saw. Money-back guarantee. \$4.95, Verdan Distributors Inc., 570 Thomas Ave., Rochester 17, N. Y.

Danish Oil Finish

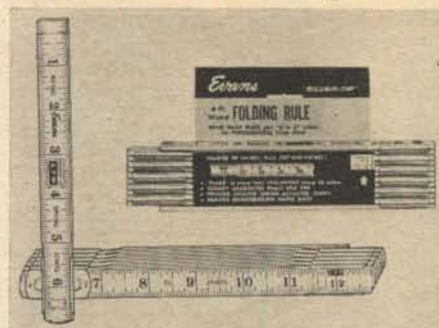


USED PROFESSIONALLY by more than 100 leading fine furniture and paneling manufacturers all over the world, and recommended by the American Walnut Mfrs. Assoc., Danish oil finish may be used on walnut, birch, oak, cherry, teak, mahogany and other woods. One application of the material seals, primes and finishes. \$2.95 for quart container, with instruction booklet. Watco-Dennis Corp., 1756—22nd St., Santa Monica, Calif.

Record-Care Booklet

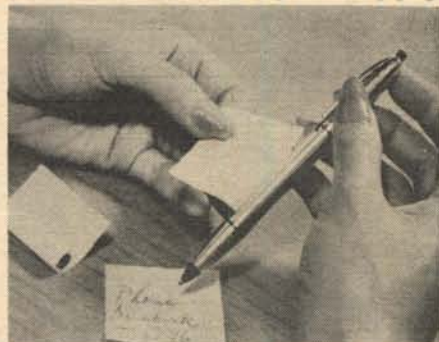
CARE AND HANDLING OF RECORDS so they last longer, selection of bargain records, musical etiquette when you play records for friends are a few of the topics covered in 20-page booklet "The Art of Selecting, Playing and Preserving Recordings." Copies 25 cents each from Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Ill.

Personalized Folding Rules



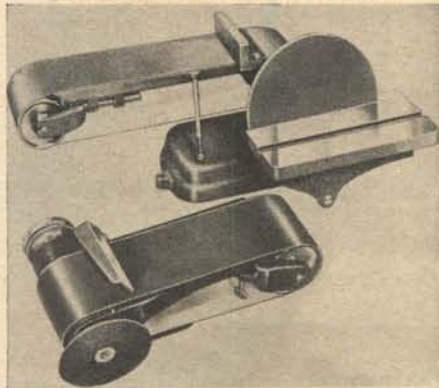
LETTERS A TO Z are included with these new wood folding rules so you can attach your initials. Rules are marked in inches, plus feet and inches for quick measuring. Stud markings 16 in. on center also are included. In addition to manufacturer's guarantee of materials and workmanship, any rule broken by misuse or accident will be repaired for just 30 cents when sent direct to factory. Evans Rule Co., Elizabeth, N. J.

Pen Has Own Paper Supply



NO PAPER WHEN YOU want to take notes? Here is the answer; a pen that has a supply of paper in the barrel. Price is just \$2.00. Paper refills \$1.00 extra, from Calmart International, 429 S. Western Ave., Dept. A820, Los Angeles 5, Calif.

Combination Sanders



ADJUSTABLE TO VERTICAL or horizontal belt positions are these two new combination disk-belt sanders. SR-5600 has 4-in. belt, 5-in. disk, SR-1000 has 6-in. belt, 10-in. disk. Exposed cylinder end permits sanding curved and irregular shapes. For more information write to: Shopmaster, Div. Energy Mfg. Co., Monticello, Iowa.

Wood Lightener-Primer



COMBINING FOUR OPERATIONS in one, this product lightens natural wood, primes, seals and fills it. Simply brushed on. Write for free circulars H and M, McCloskey Varnish Co., 7600 State Road, Philadelphia 36, Pa.

Workshop Vacuum Cleaner



THIS INDUSTRIAL-TYPE unit doubles as a dust collector in the home workshop and a heavy-duty vacuum cleaner for the basement, garage, attic, etc. Full horsepower motor pulls up to 60 cu. ft. of air per minute into a drum container with almost 3-bushel capacity. Can be connected directly to power tools, used with vacuum attachments. \$49.50 from Delta Power Tool Div., Rockwell Mfg. Co., 479 N. Lexington Ave., Pittsburgh 8, Pa.

Booklet on Oak Floors

WEALTH OF FLOORING INFORMATION is included in a 32-page, pocket-size homeowner's guide. Among subjects covered: variety of oak-flooring styles, sizes and grades; how to install oak floors over concrete slabs, nailing recommendations and how to estimate amount of flooring needed. For free copy write: Oak Flooring Information Service, 75 E. Wacker Drive, Chicago 1.

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New! Complete details 3 different houses. Calif. style, Colonial, English, etc. Cat. No. 364 . . . \$1.50

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New! For houses covered by above plans; 5 rooms of quality furniture with doors, drawers that work. Scale 1 in. to ft. No. 365 . . . \$1.50

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Desks for all purposes. Six fine designs. No. 371. \$1.50

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Up to 22 in. high. Pinups made of thin plywood, painted in colors, delight youngsters. No. 314 . . . \$1.00

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New! Wonderful conversation piece. Single hand indicates hours, fractions. Surprising in simplicity. Full-size patterns all parts. No. 372 . . . \$1.50

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Great variety of subjects. Professional quality art. No. 349 . . . \$1.50

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Chairs, tables, benches, folding. Full-size patterns. Modern designs. No. 348 . . . \$1.50

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Unusually cute designs. Full-size patterns. No. 347. \$1.50

Use Craftplans to make things for FUN and to SELL.

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New! Dramatic presentation of Nativity Scene . . . rich in beauty and color. Creche height 8 ft. Full-size patterns all figures. No. 370 . . . \$2.00

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Also, how to plate with copper, nickel, chromium, zinc. No. 362 . . . \$1.00

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Store SAFELY Shotguns, Rifles, Handguns; also fishing rods, lures, etc. No. 344 . . . \$1.00

16 WHATNOT SHELVES, WALL RACK
Latest fashions in wall decor. All patterns full-size. No. 342 . . . \$1.00

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16 Designs. Want bird houses that are completely different; if so, don't overlook these plans. No. 341 . . . \$1.00

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24 different. More fun than a barrel of monkeys. No. 338 . . . \$1.00

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2" high. Novel Lettering patterns you can use. #336 \$1.50

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4, 8" high. Alphabet, numerals. No. 333 . . . \$1.50

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12 designs, complete how-to-make details. No. 307 . . . \$1.50

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\$6.00 WORTH OF PLANS FOR \$5
If price of plans you order is \$5.00 we'll include without extra charge another dollar's worth of plans of your selection. If price of plans selected is \$10.00 you get \$2.50 worth of Free plans. Your money back if you're not satisfied.

18 DECORATOR STYLES, MODERN WALL CLOCKS
Designs compare favorably with clocks selling for up to \$5.00. No. 326 . . . \$1.00

ELI TERRY CLOCK
With Wood Gears. All details and patterns needed to duplicate famous original made in 1794. No. 325 . . . \$1.50

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Powered by small gas engines. Two designs—racer, Jeep. No. 322 . . . \$1.00

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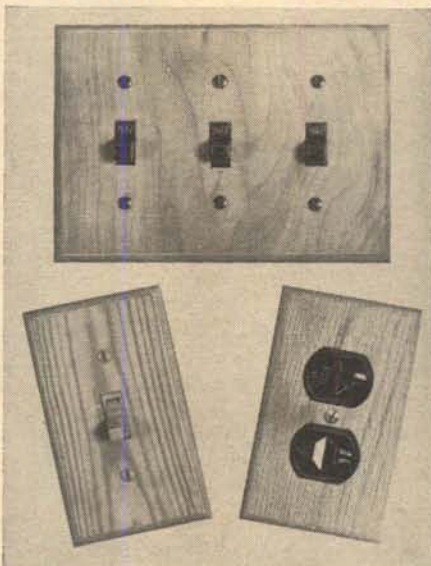
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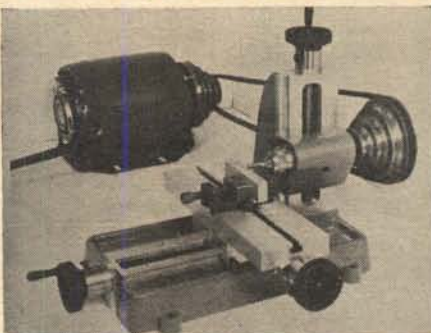
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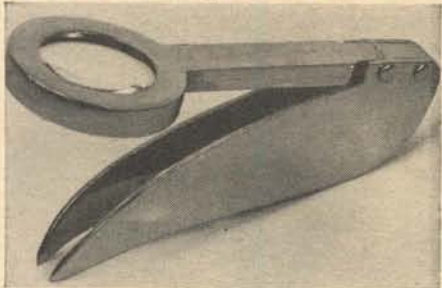
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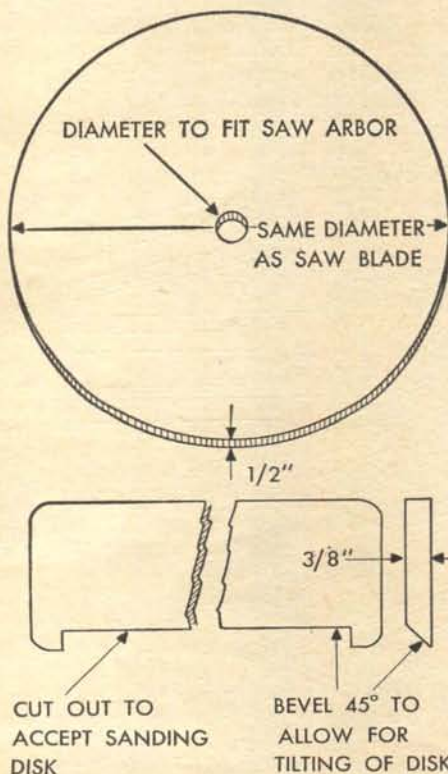
Table Saw Converted To Disk Sander

DICK HUTCHINSON



Even thin stock can be sanded with the aid of the rip fence, with the saw-table disk sander.

FIRST STEP in converting a table saw to a disk sander is to cut a disk from $\frac{1}{2}$ -in. plywood the same diameter as the saw blade. The disk can be cut slightly oversize, then trued up by bolting it to the saw arbor. Allow the disk to just project above the table, to rotate against a wood rasp, then sandpaper. Attach the proper-size sanding disk with regular sanding-disk adhesive. Replace the saw-table insert with a wooden plate that has a slot wide enough to accommodate the disk. Bevel the edge of the slot, to clear the disk when it is tilted.



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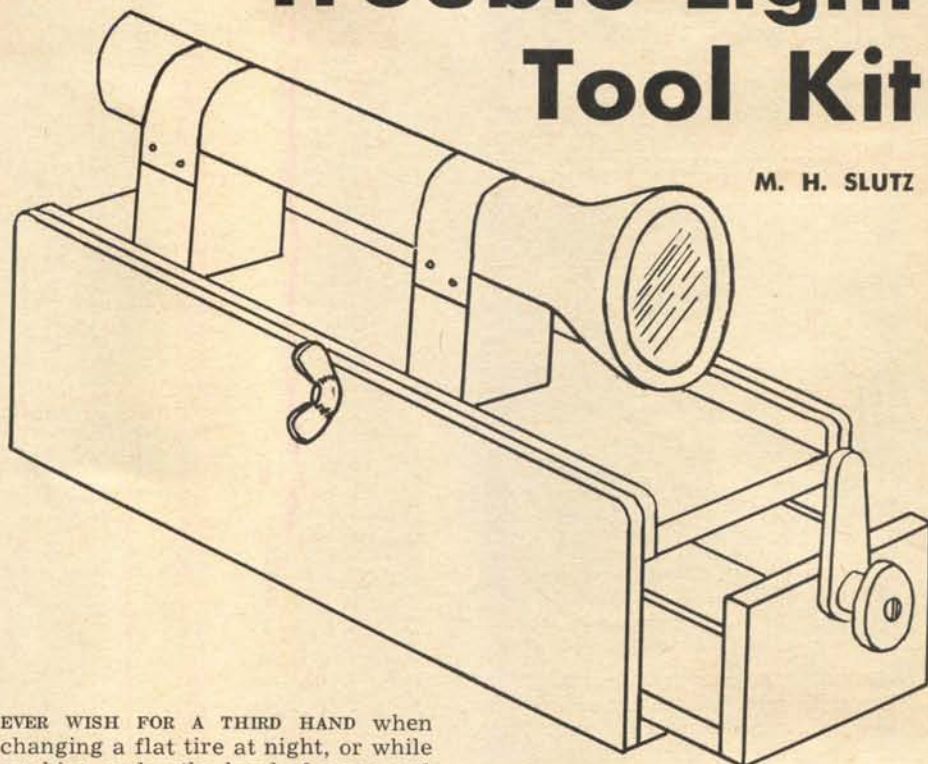
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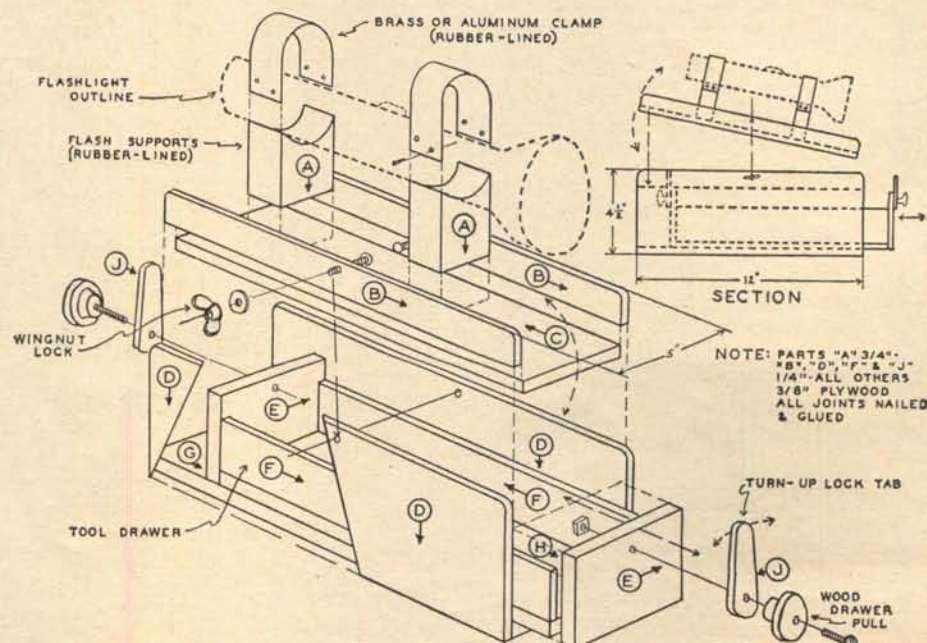


EVER WISH FOR A THIRD HAND when changing a flat tire at night, or while working under the hood of your car? Build this handy trouble-light kit that not only positions the light where you want it, but which holds a number of tools as well. The unit utilizes any standard flashlight, which serves as a carrying handle when not in use. The tool drawer, when removed, allows the top to pivot up or down between the case sides and two wing-nuts lock the light at the required angle. Two turn-up tabs keep the tool drawer in place and the pivoted top locks horizontally when the drawer is inserted. The drawer may be used for first-aid equipment, rather than for tools, if desired. Δ Δ

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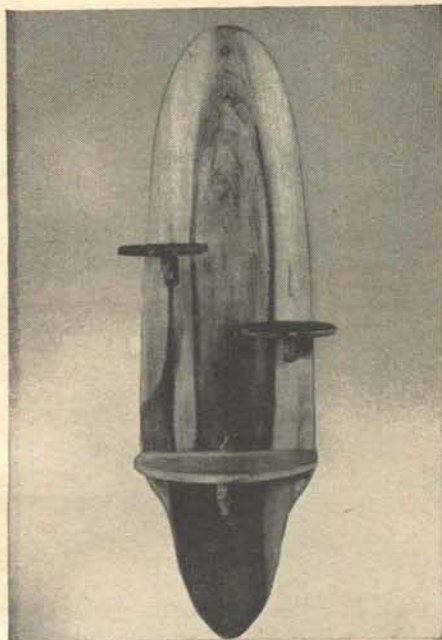
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Shelves From Scraps

DICK HUTCHINSON



ANOTHER USE FOR SCRAPS of wood that collect in the shop are small knick-knack shelves, such as shown. These shelves are especially attractive if you can find pieces of stock with unusual graining. Note that the larger shelf is of light wood, to contrast with the darker portion of the back piece. Scraps of dark wood were used for the smaller shelves that are located on the lighter areas of the back. This particular unit is 5 in. wide and 12 in. high, but dimensions, and shapes, can be changed to utilize pieces from your own scrap box. △ △

IN THE NEXT ISSUE . . .

ANNUAL BOATING ISSUE

Sailing Catamaran Converts to Pull Water Skier

Water-Ski Ramp
How to Water Ski
Know Your Ropes
What's New in Outboards
Contemporary Setee
Modern Dower Chest
Home-Shop Metal Brake
Using Hole Cutters

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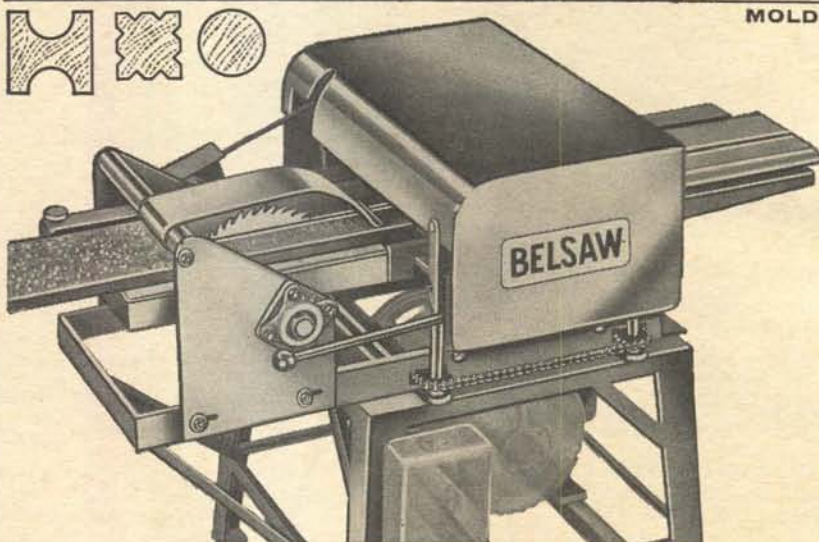
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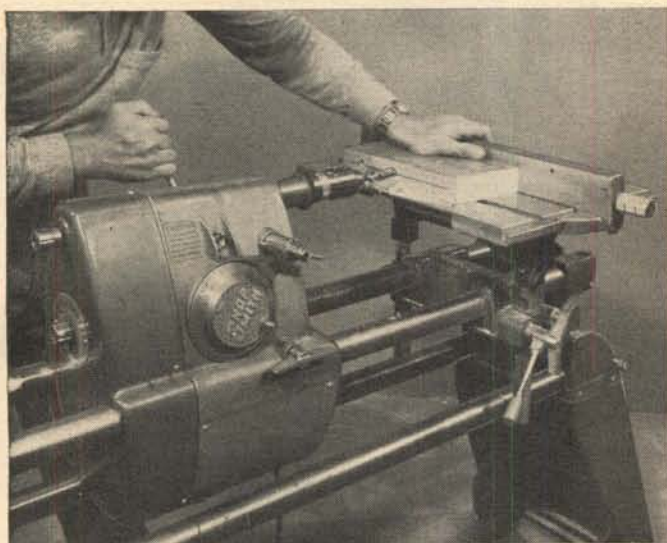
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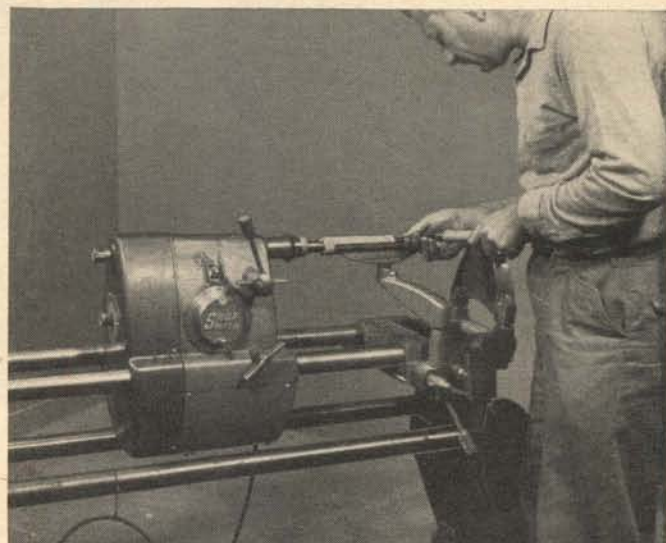
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Multipurpose Tools In The Model Shop

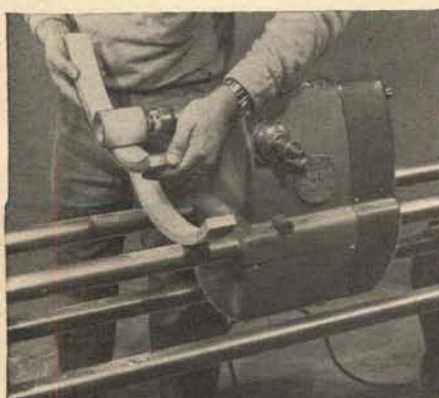
1. Pioneer in field, ShopSmith is original multipurpose tool for home workshop. Tool here is used as table saw, planer at left end is extra-cost accessory.



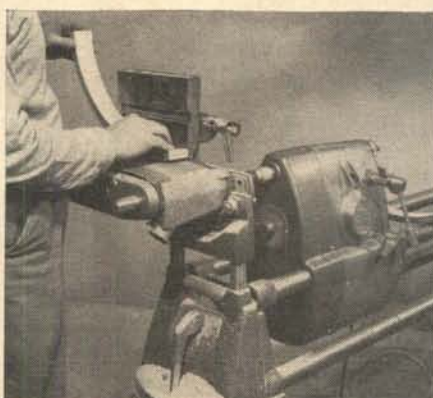
2. When ShopSmith is used as horizontal drill press, arbor is moved back and forth like quill of drill press by means of lever. Work can be held on table against saw rip fence, or table can be tilted to vertical position.



3. Lathe of ShopSmith has swing of 12 in. over ways, maximum distance between centers of 34 in. Speed control permits instant changes of speed for roughing, finishing cuts, sanding, etc. Tool rest stays parallel to work.



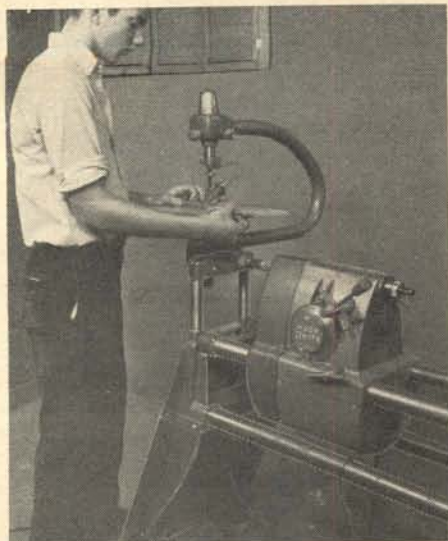
4. Handy, low-cost accessory is drum sander. Drum also could be positioned vertically, work held solidly on saw table, moved against drum.



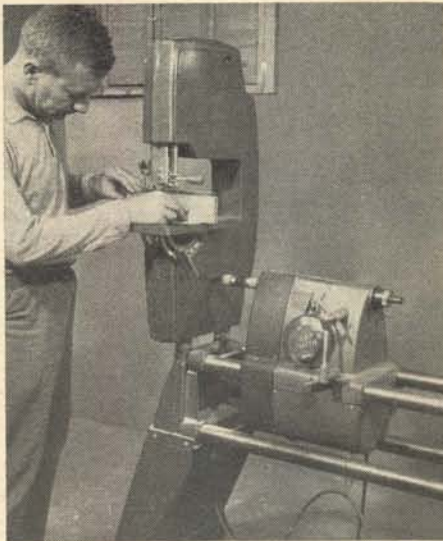
5. Belt-sander accessory has 6 x 48-in. belt for long wear, can be adjusted vertically or horizontally. Table can be used in several positions.

INCREASING INTEREST in multipurpose power tools is reflected in the WORKBENCH Model Shop, where four such units are in constant use. Of the four, three are types that would do well in any home workshop; the ShopSmith, SawSmith and Dewalt Power Shop. The fourth unit, the Belsaw, is for the home craftsman who wants to make extra money, or who has a supply of rough lumber that can be finished, shaped or resawed and sold for a profit.

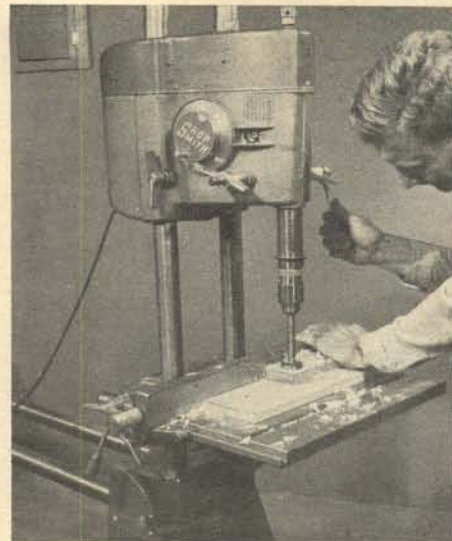
There are two reasons for the growing popularity of multipurpose tools. One is that many home workshops have limited space; the other, equally important, is the lower cost of a multipurpose unit as compared to separate tools required to do the



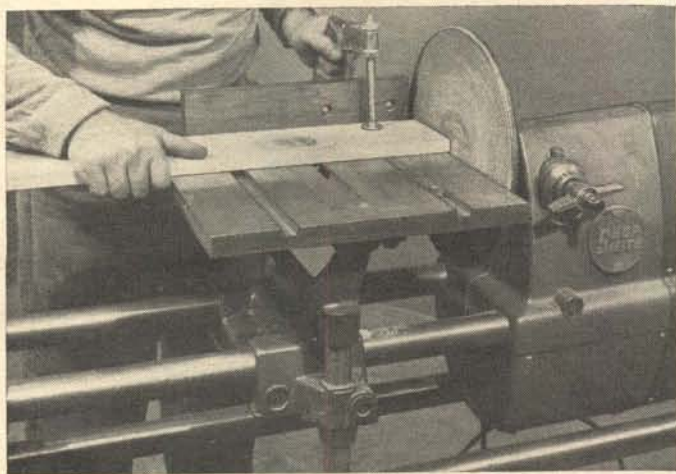
6. Jig saw with 18-in throat has built-in dust blower. Tubular arm can be pivoted below table, so unit can be used as saber saw or filing machine. Blade chucks index at 90 deg.



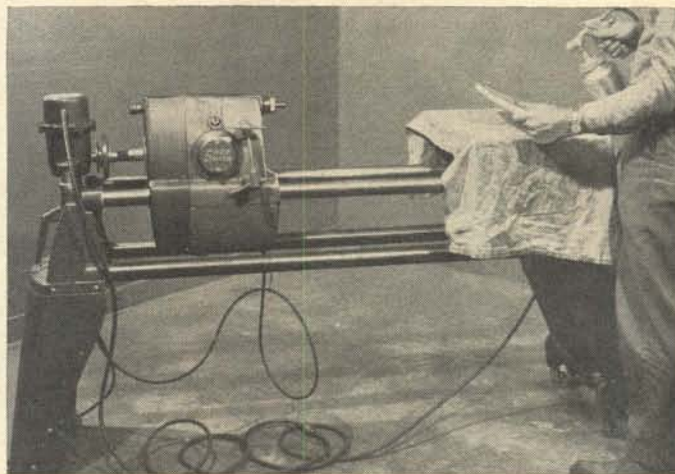
7. Band saw has 11-in. throat, will cut stock up to 6 in. thick. Cross slots in table permit use of miter gauge for straight cuts. Table tilts 5 deg. left, 45 deg. to the right.



8. As vertical drill press, ShopSmith drills to center of 16½-in. circle, has 26 in. between chuck and table, 58 in. between chuck and floor. Table will tilt from 0 to 90 deg. to handle all work.



9. Disk sander has aluminum plate, is furnished as standard equipment on basic ShopSmith unit. It can be used with table, work being positioned on table with miter gauge. Handle for miter gauge is extra-cost item.



10. Paint-spray compressor can be used for painting projects in shop, or with special adapter, connected to garden hose to extend range up to 115 ft. from compressor. Ideal for painting exterior of home.

same operations.

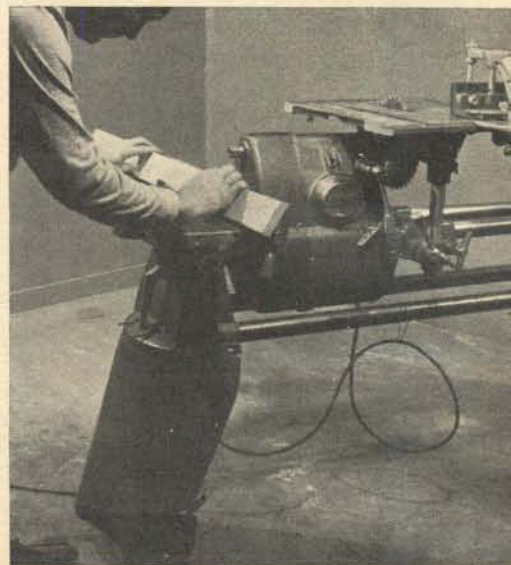
Synonymous with "multipurpose tool" is ShopSmith, Figs. 1 through 11. Our unit is a Mark V; there also is a lower-priced model called the Mark II. The basic unit is a table saw, Fig. 1, (the jointer-planer on the left end of the machine is an extra-cost accessory), that can handle large pieces of material because of the support on the right end of the machine. It also is a horizontal drill press, Fig. 2; a lathe, Fig. 3; and a vertical drill press, Fig. 8. It also is a disk sander, Fig. 9. In the latter case, note that the miter gauge can be used to keep work square against the face of the disk. An inexpensive accessory is a drum sander, Fig. 4. (Drill bits, lathe chisels and the like also are not included with the basic unit.)

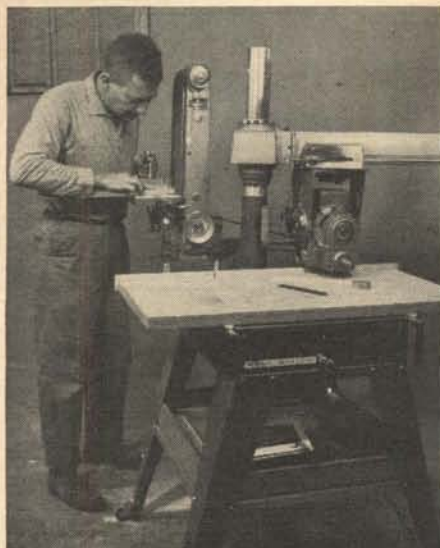
When you wish to expand your selection of power tools, no more floor space is required. The basic Shop-

Smith will power a number of tools. Because the tools are purchased without motors, their cost is that much less. Incidentally, this is one of the main advantages of all multipurpose tools. On the ShopSmith, a short flexible coupling is used between the left end of the power unit and the accessory tools. Available are a 6-in. belt sander, Fig. 5; a jig saw, Fig. 6; a band saw, Fig. 7; a spray-painting compressor, Fig. 10, and a jointer-planer, Fig. 11.

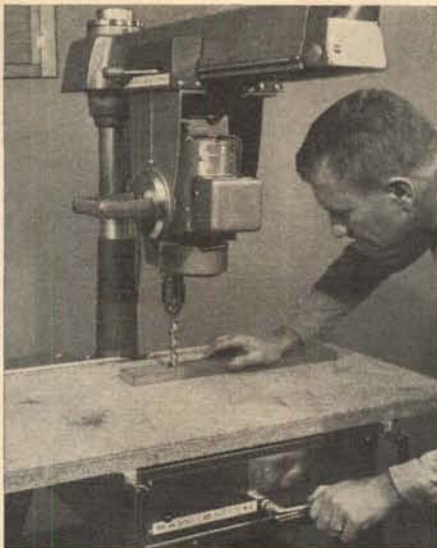
First cousin to the ShopSmith is the SawSmith, Figs. 12 through 20. Basically, the SawSmith is a radial-arm saw, Fig. 14. With the addition of an "add-a-tool" bracket (visible behind the saw blade in Fig. 14) the

11. Cast-iron fence of 4-in. jointer-planer can be set at most-used angles with adjustable stop. Spring-loaded safety guard can be used on either side of fence for jointing and rabbeting.





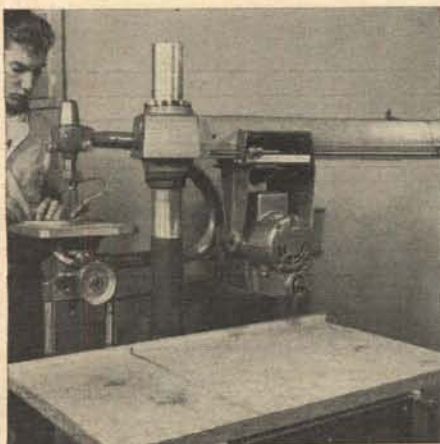
12. When Magna belt sander is used on SawSmith, it can be driven by belt, as here, or by flexible coupling fitted on bushings.



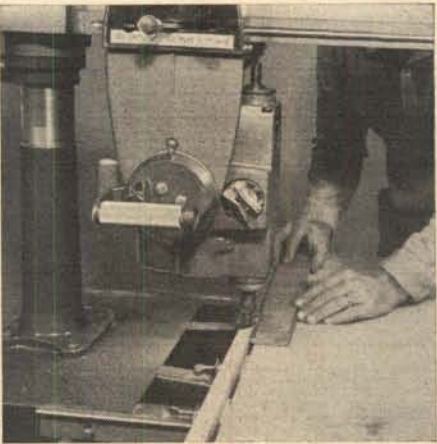
13. SawSmith can be used as vertical drill press, "quill" being raised and lowered by height adjustment of radial arm on the saw.



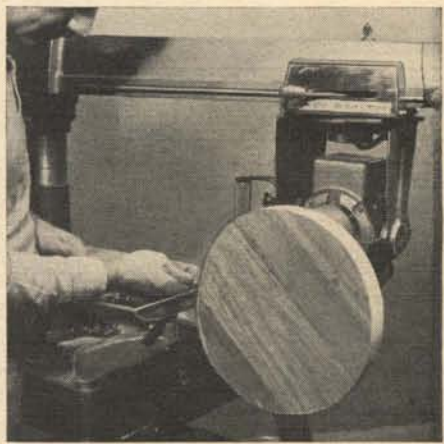
14. SawSmith basically is a radial-arm saw. Here it is being used to crosscut, it can be used for bevels, miters, compound miters, ripping.



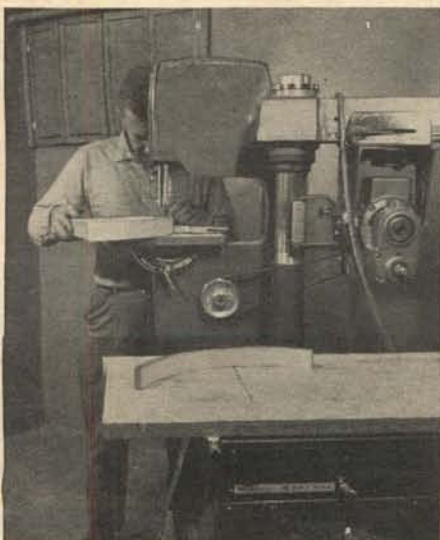
15. Jig saw used on ShopSmith can be used in much the same manner on SawSmith. Use of belt and pulleys clears radial arm.



16. Shaper bits are used with adapter to fit on arbor of saw motor. Fence of saw must be modified to permit use of shaper, as indicated.



17. Tool rest fitted in tool bracket on SawSmith permits making faceplate turnings as large as 36 in. Ideal for making lazy-susan table tops.



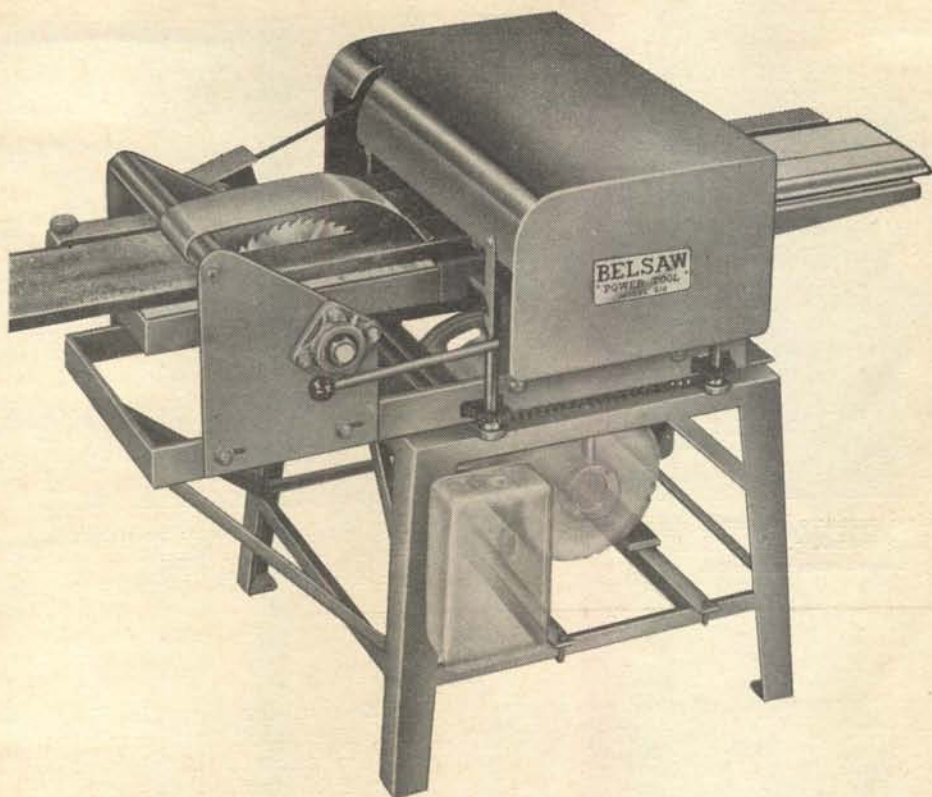
18. Band saw on SawSmith is used in much the same way as on ShopSmith. Variable-speed control on saw matches control on ShopSmith.



19. Paint compressor can be driven either by belt and pulleys or by direct drive with flexible coupling. All factors are as on ShopSmith.

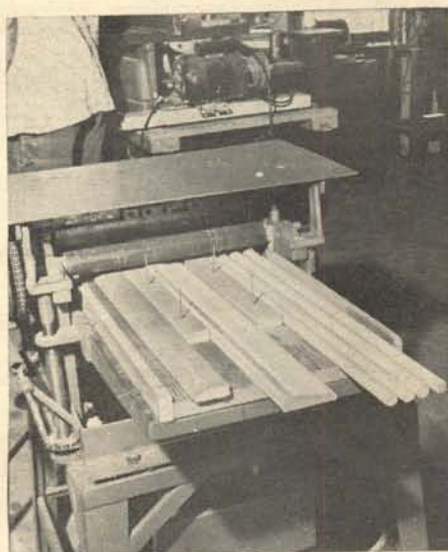


20. Jointer-planer is handy tool when fitted on saw. It can be used immediately to smooth work that has been ripped or crosscut to a rough size.

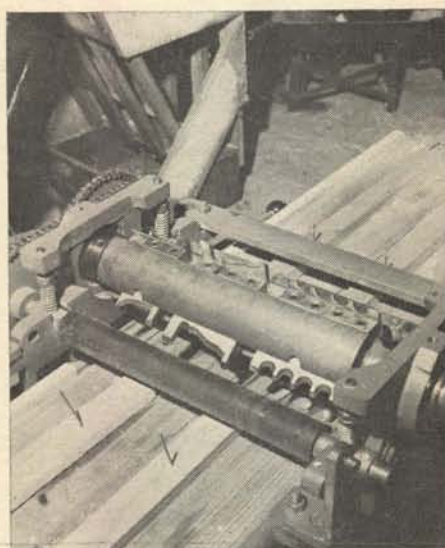


21. Belsaw unit saws and planes in one operation. Addition of shaper blades permits it to make three operations with one pass.

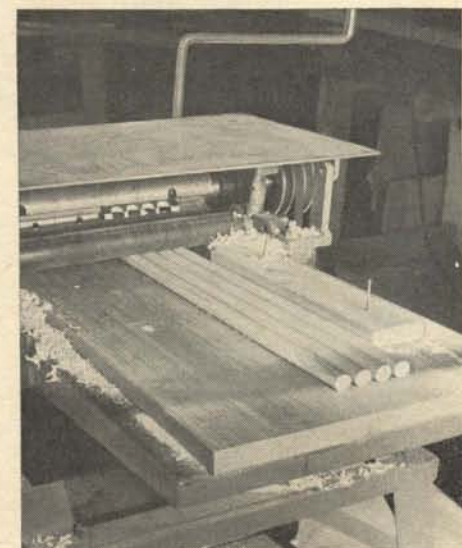
22. Shown here is one of the many types of interesting wood paneling that can be made on the Belsaw combination power tool.



23. Demonstrated here is how Belsaw unit can produce three different shapes in one pass. Strips are nailed to bed to keep stock aligned.



24. Cover has been removed from Belsaw unit here to show manner in which shaper knives are fitted in place of gibbs that hold planer blades.



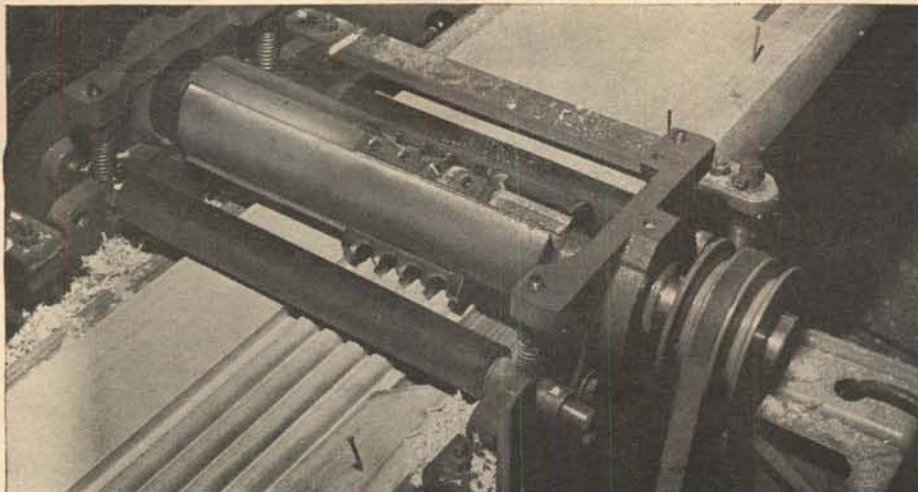
25. Dowels are shaped on unit with two passes. This photo shows stock coming out after second pass, with dowels completely separated.

which of the drive methods would be best for you. The basic SawSmith, with the addition of a chuck, Fig. 13, can be used as either a vertical or horizontal drill press. An adapter and shaper bits makes the SawSmith a shaper, Fig. 16. With the aid of a tool rest in the "add-a-tool" bracket, Fig. 17, faceplate turnings up to 36 in. in diameter can be made. It would require an extremely large wood lathe to equal this capacity. The adjustable-speed feature of the

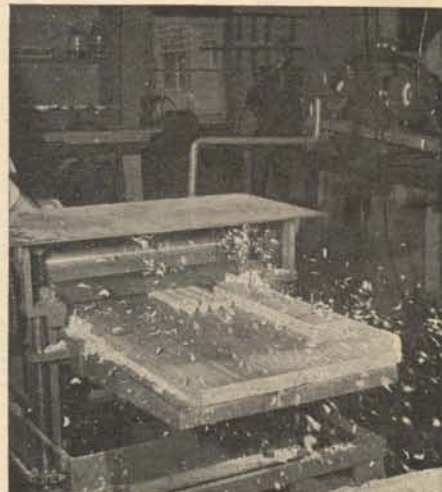
SawSmith permits handling such large work.

The Belsaw multipurpose unit, Figs. 21 through 27, is not the sort of tool that would be in the average home workshop. It is meant to be a profit-making machine. If you have a wood lot from which you can cut your own timber, or if you have access to a supply of rough-cut lumber this would be the machine for you. In basic form the Belsaw unit is a self-feeding planer and saw, Fig. 21.

The stock is pushed into the saw until it contacts the feed rollers of the planer. The rollers then feed the stock into the planer knives and pull it through the saw. Thus, sawing and planing are done in one operation. Removal of some of the gibbs that hold the planer blades permits installation of shaper blades, Figs. 24 and 26. (The cover has been removed for purposes of illustration.) The set-up in Fig. 24 produces the three shapes shown in Fig. 23. To produce



26. First pass of flat stock through the Belsaw machines produces half-round shapes, with stock still one solid piece of material. This could be used as fancy paneling. When stock is turned over and fed back through the machine, dowels are completely shaped and separated.



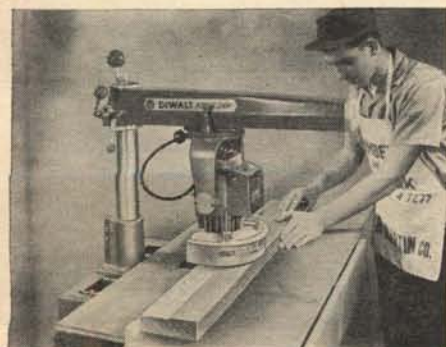
27. Power feed on planer pulls stock through, eliminating much of the labor. Cover on machine keeps chips flying away from operator.



28. Because motor of DeWalt Power Shop can be tipped at any angle, shaper knives can be made to cut many more contours than if held at one angle. When shaper head is used in this manner, regular saw-blade guard is used. Changing depth of cut also changes cut contour.

just dowels, the setup in Fig. 26 is used. The stock is passed through and the shaper blades cut half through the stock, then the material is turned over and run back through the machine, Figs. 25 and 27. In Fig. 22 is shown one of the many interesting types of wood paneling that can be made on the Belsaw.

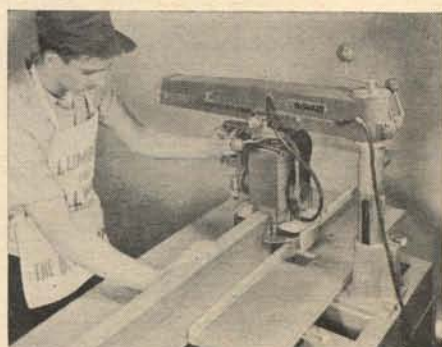
The DeWalt Power Shop, Figs. 28 through 40, is basically a radial-arm saw of great versatility, Figs. 31 and 37. A great variety of accessories driven directly by the saw motor (with the exception of the lathe, Fig. 35, that is belt driven), make the DeWalt a true multipurpose tool. (DeWalt calls it a "Power Shop.") The rotary planer, Fig. 29, smooths rough lumber, readies it for sanding. Special guard provides maximum safety. Shaper blades change the DeWalt to a shaper; tilting arbor gives 50 per cent more shapes per cutter, Fig. 28. Either fixed or free-hand routing can be done, with router bits held by special adapter and driven by the saw motor, Fig. 30. Attached directly to the motor hous-



29. With special guard, shaper is used in horizontal position, motor being vertical. With this setup anything from cutting rabbets to surface planing is simple operation.



30. Router bits chucked in adapter permit free-hand routing, as here where bit is used to cut name in wood, or straight-line cuts, using rip fence as guide for stock.



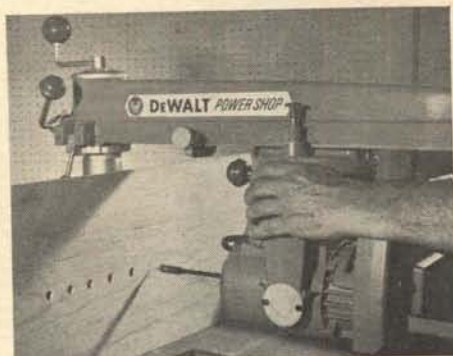
31. When used as basic radial-arm saw, DeWalt unit can be used even with blade in horizontal position for making special cuts. Note that shaper guard is being used.

ing, the jig saw, Fig. 33, can be tilted at any angle for sawing. Adapters and bits permit the DeWalt Power Shop to change to a horizontal drill press, Fig. 32, that can drill at almost any angle by swinging the radial arm. Both cup and straight grinder wheels can be used, a guard

and tool rest making the grinder both safe and accurate; ideal for sharpening all edge tools, Figs. 34 and 40. For buffing and polishing, a buffing wheel easily is bolted on the saw arbor, Fig. 36. A drum sander can be positioned either vertically, Fig. 38, for sanding on the table, or hori-

zontally, Fig. 39, for free-hand sanding. Capacity of the wood-turning lathe, Fig. 35, is a 12-in. swing, with 36 in. between centers.

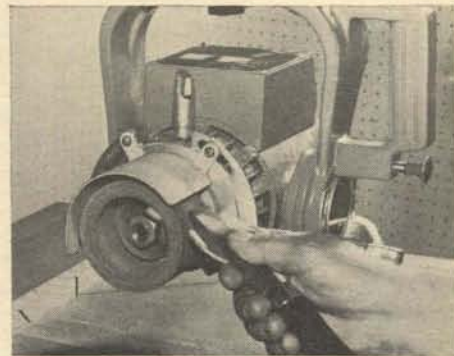
As with the ShopSmith, neither the SawSmith nor DeWalt Power Shop require more floor space when used as other than radial-arm saws. Δ Δ



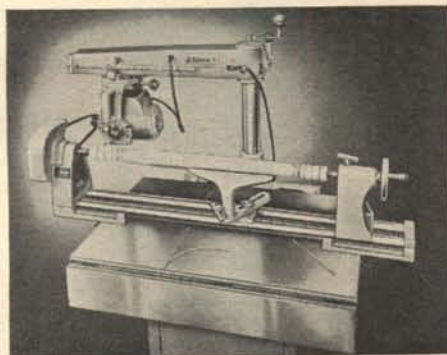
32. DeWalt unit can be used as horizontal drill press, will bore holes at compound angles in stock. Note that stop is used to assure equal depth for all holes drilled.



33. Jig saw for DeWalt is fastened directly to motor housing. Changing angle of motor changes angle of cut, making this extremely versatile tool. Variety of blades available.



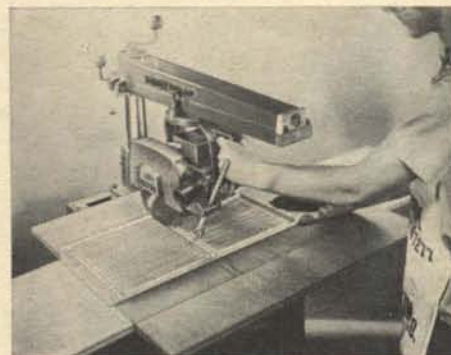
34. Cup wheel bolts directly to arbor of motor. Guard and tool rest are provided with this accessory, making it safe and accurate sharpening device for a home workshop.



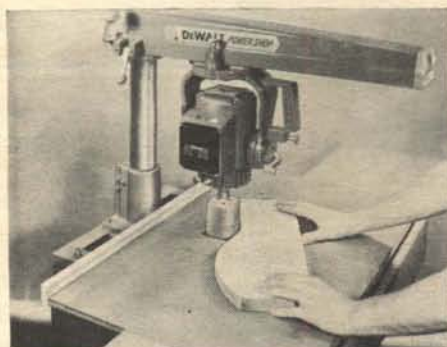
35. Lathe for DeWalt clamps to saw table, is driven from motor by belt and pulleys. Lathe has 12-in. swing over ways, distance between centers is full 36 in. to handle most work.



36. Buffing wheel is needed in every shop for polishing metal, producing final high gloss on other materials. Buffing wheel bolts directly to arbor of motor on DeWalt Power Shop.



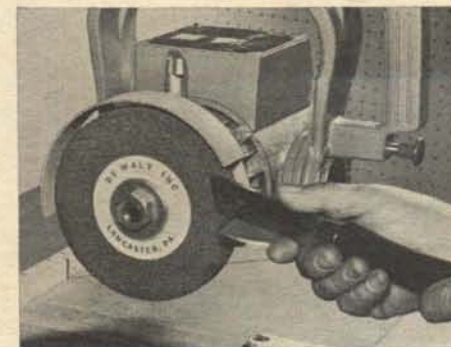
37. Dado blades permit fast cutting of grooves in stock, layout lines on work are always in full view. Dado blades work best when saw is pushed, rather than pulled through stock.



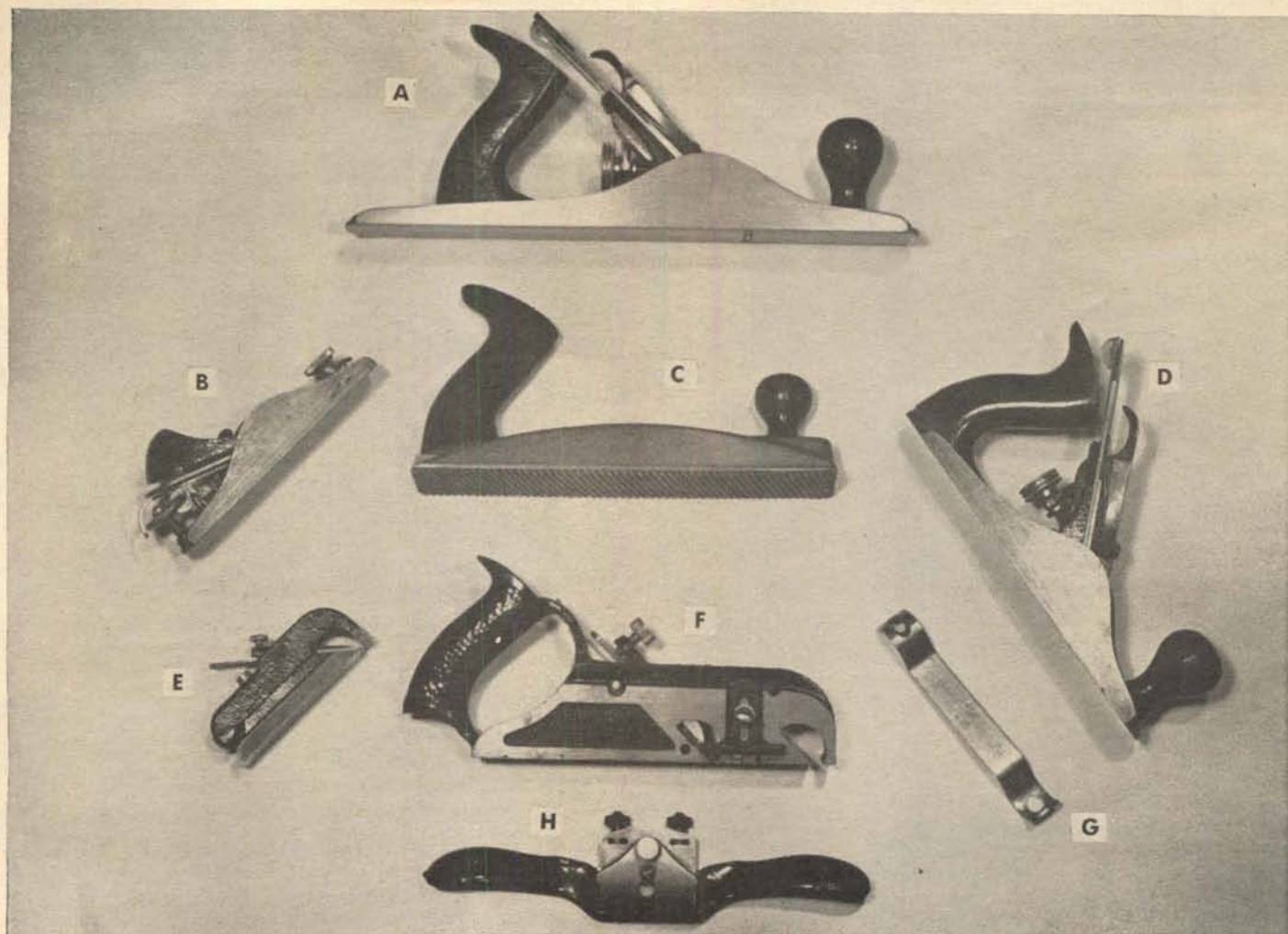
38. Drum sander fitted on motor arbor can be used vertically, with lower edge below table top as here. Work is held firmly on table, moved against sanding drum.



39. Drum sander also can be used in horizontal position for free-hand sanding of irregular-shape work. Variety of grits can be used on sander, for use on many jobs.



40. Regular-shape grinding wheels also are available for DeWalt unit. These wheels are ideal for sharpening tools with extreme angles, as some turning chisels.



1. Planes shown are: A-jack, B-block, C-Surform, D-bench, E-bullnose, F-rabbet. G is a cornering tool, H is a spokeshave; both are a type of plane.

Planes Work For You

RALPH TREVES

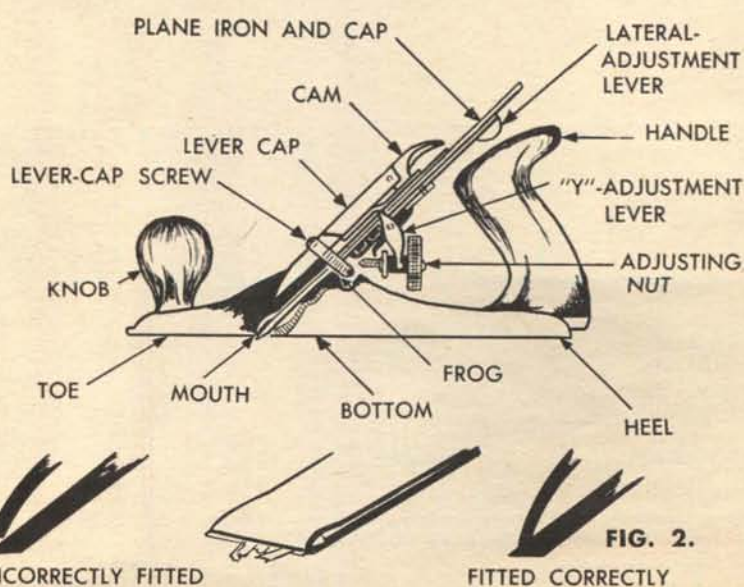
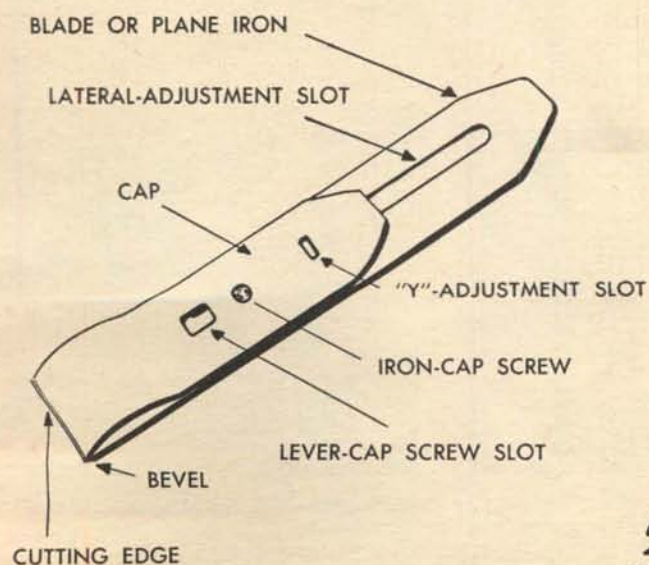


FIG. 2.

WHILE YOU MAY GET ALONG with just one small bench plane for jobs in your home workshop, the addition of one or two other types will not only permit you to do more varied work, but may improve the quality of all the planing that you do. For example, a couple of quick passes with a long

jack plane will straighten the irregular edge of a plank to permit using it for a shelf. A small bullnose plane cleans the corners of rabbets and tenons to assure a tighter fit.

Special planes do jobs that no other tool can handle as well. The rabbet plane is ideal for cutting rabbets on

door edges to fit weatherstripping. Cutting a rabbet on a heavy door with a table saw would be difficult.

A spokeshave, a pull-type plane, is fine for working on curved or irregular edges. Surform tools also do well on such jobs. Pocket-size versions of the Surform planes can be



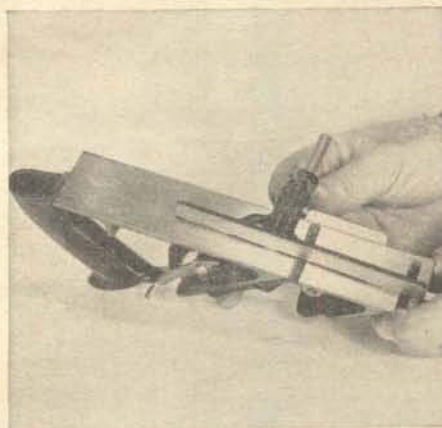
3. Small block plane is handy, almost essential, tool in any shop for trimming and squaring work. It is small enough to be carried in your pocket, kept handy for jobs away from shop.



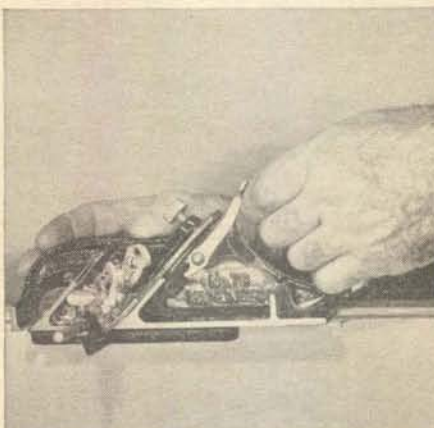
4. Shaped and handled like a file, this member of Surform line of tools is a type of plane with many small cutting blades. Ideal for locations where regular plane cannot be used readily.



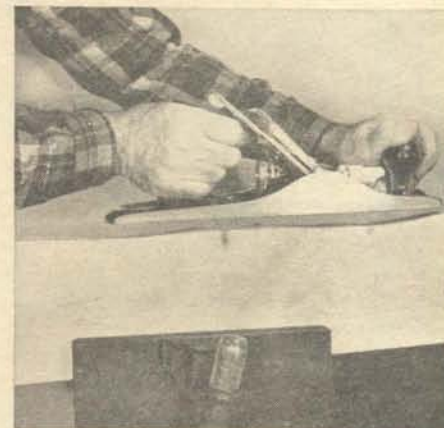
5. Modern bench plane has adjustable cutters, handy push knob, rigidly-mounted blade to eliminate chatter, engineered integral frame. When shavings like this come up, plane is sharp.



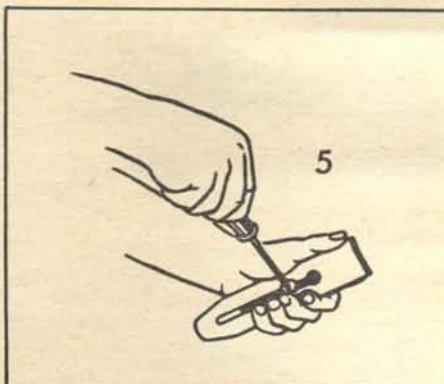
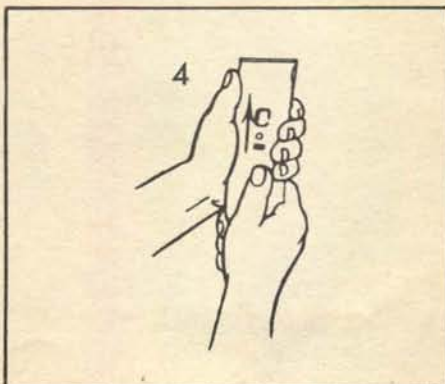
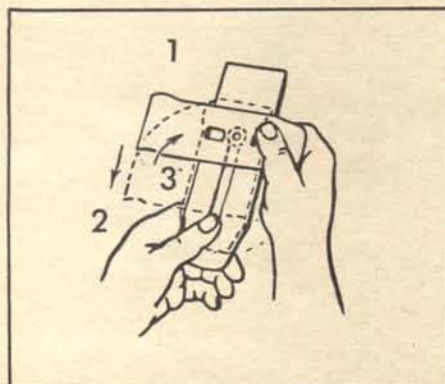
6. View of underside of rabbet plane shows how spur fence is mounted on shaft attached to side, is adjustable across width of bottom. Note second slot near front end of the bottom.



7. Rabbet-plane blades may be shifted in two positions, cutting to the very edge of work when necessary. Blades extend to side, with spur fence controlling cut. Plane also has depth gauge.

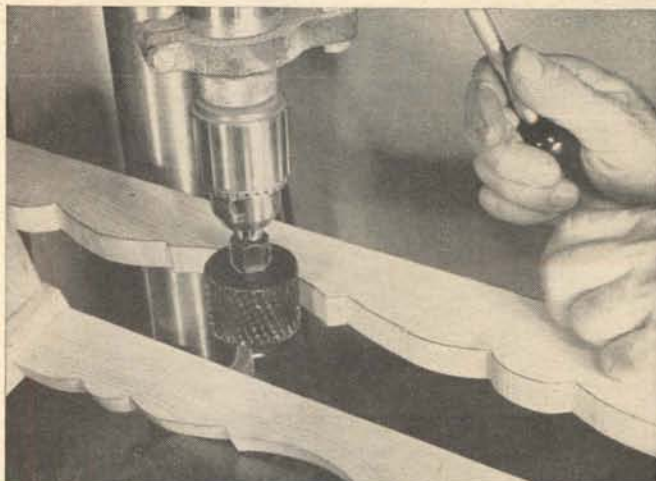


8. Greater length of jack plane permits it to do jobs impossible with smaller types. As shown here, the long casting permits it to span low spots until high spots are planed down level.





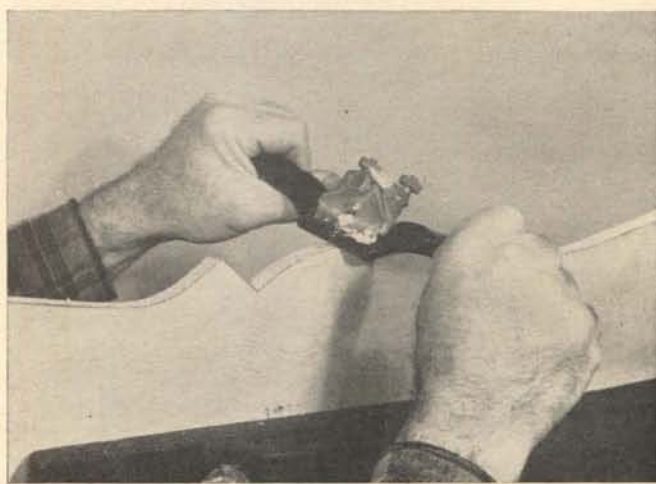
9. Surform material here is used on tool built much like regular plane. Because cutting surface consist of many small blades, it produces smooth, regular surface. It also can be used on plywood, soft metals and plastics.



10. Same material as used in Surform planes is available in drum-shape for use on drill press. This "circular plane" does excellent job in smoothing edges of work that has been jig-sawed or band-sawed as here.



11. Still another form of the Surform unit is this curved plane that is ideal for irregular shapes such as this cornice board. When cutting surface becomes dull it cannot be sharpened, but replacements are inexpensive.

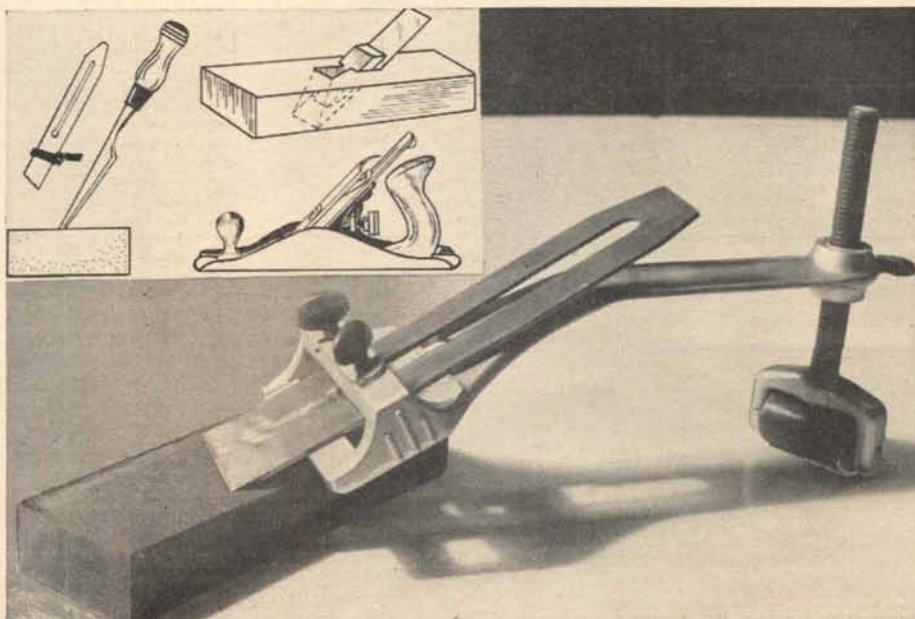


12. Spokeshave actually is a form of plane, the main difference being that the blade of this tool is pulled into the work, rather than being pushed, as is the blade of a plane. Spokeshave has more flexibility.

carried to the job, will quickly plane down the edge of a sticking door without the need for removing the door from its hinges.

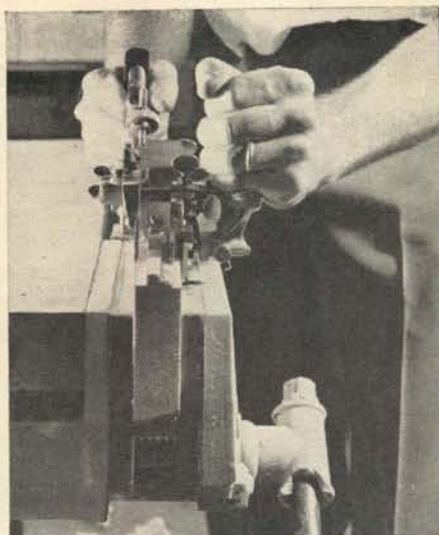
As with any cutting tool, the blade of a plane must be kept sharp for it to do the best job. Note also, as shown in the drawing, that the end of the cap for the plane blade must fit tightly against the blade to prevent shavings wedging under it. Next time you are at your favorite hardware store, examine the different types of planes; there may be one to fill out your collection of hand tools. In your shop keep the planes apart from other tools, store them so the blades are not damaged. $\Delta \Delta$

13. As with any cutting tool, a sharp blade is the secret of good workmanship. Device shown here keeps blade at same angle for honing. Oilstone should be smooth and flat.





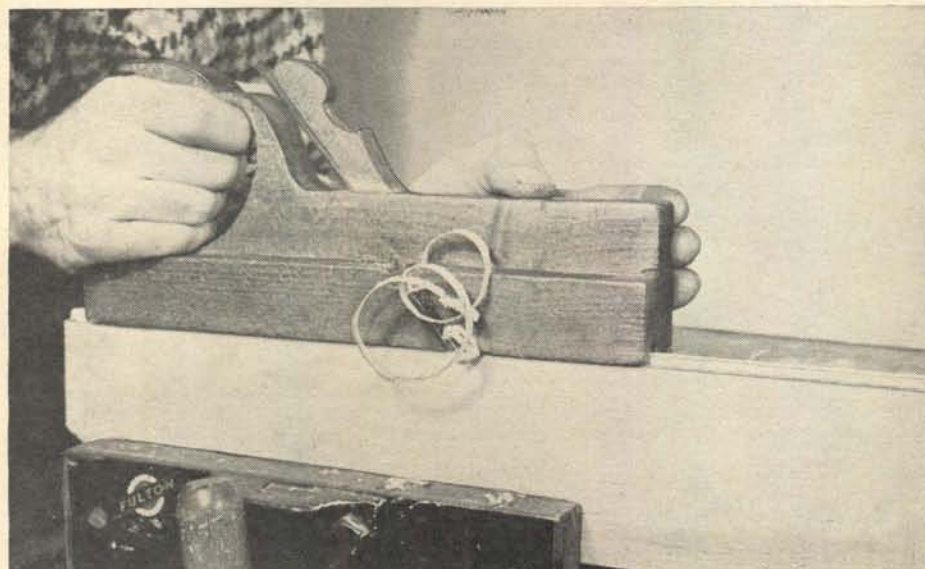
14. Combination plane is a complete machine in itself, can be set to cut tenons, tongued joints, rabbets. Blades cut to very edge of stock.



15. Front view of combination plane shows position of cutters for shaping both sides of a tongue. Dozens of blade shapes are available.



16. Correct use of plane requires firm grip on handle and knob so that bottom of plane is held solidly against wood surface, angle of cutting blade is kept the same throughout the cut.



17. When you have trouble with your plane, remember this plane that was used many, many years ago. Open side of plane permits shavings to clear, blade is retained with a wedge.

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Ask Your Lumber Dealer

FRED STEBBINS



1. When you get to your lumber or building-supply dealer's look around. Each month literally hundreds of new items are being put on the market for do-it-yourselfers. Each one is designed to make a job easier and to assist in making projects more professional in appearance. Know what is available before you tell the clerk what you want.

YOU CAN SAVE MONEY, time and trouble when you go to a modern lumberyard if you determine what services, as well as materials, are available. We did our research at the Overland Park Lumber Co., Overland Park, Kansas, an organization that specializes in sales and service to the homeowner and do-it-yourselfer.

When you enter the showroom, Fig. 1, take a good look around. Every month there are dozens of new items put on the market especially for the home craftsman. These items can be new tools, special kinds of fasteners, unusual types of material. Asking a clerk about some of the items might prove to you that one of them will do a better job on a proposed project than the article considered originally.

Is there an item available that will cost less, even save time and trouble, as compared to a home-shop job? A backboard for a basket-ball net, Fig. 2, might fall in that category. Don't be afraid to compare the costs of completed items as compared to the costs of the required materials for building it yourself.

Is there a project in WORKBENCH you would like to build, but are not sure of the required material? Quite likely your lumber dealer, Fig. 3, can sit down with you and make up a material list to do the complete project—making it a real one-stop service. And while you are getting the



2. Youngsters appreciate the extra services offered by a building-supply dealer too. Here a sports-minded lad is getting a pre-cut basket-ball backboard. Yes, it's regulation size—the dealer has checked to make sure.



3. Here Henry Basler, left, manager of Overland Park Lumber Co. makes notes while his customer explains how he "wants to make a cabinet like the one in the magazine."

material, how about the oversize or overlong pieces? Why not get them cut at the yard, Fig. 4. They will be easier to haul home in the car, and will save trouble in your own shop.

When you go out into the yard to get your lumber, Fig. 5—or even before, when you are making out your order at the desk—tell the man what the lumber is to be used for. The

cheapest grade is fine for concrete forms, no need to get clear, straight-grained higher-cost lumber for that job. Interior-grade plywood will do the job if the project will be used indoors, more expensive exterior grade is not needed.

Check with your lumber dealer next trip, and find out about those added services.△ △



4. There is advice and practical suggestions from the front office, and there is more in the mill. C. G. Tobey, shop foreman demonstrates a typical service of a modern lumberyard: Precutting pieces for anything from a doghouse to lawn furniture. Take your working drawing back to the shop.



5. Here a customer gets another lesson, this time in lumber grades. Harry Casaert, right, yard foreman points out grade marking on a 2 x 4, explaining that form lumber for concrete does not have to be the best grade. When Harry knows what lumber is used for, he can save customer money.

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Shell-Back Chair and Coffee Table

Roberta Fairall

CASUAL AND MODERN, yet completely practical is this set consisting of a chair and a two-piece coffee table. You can, of course, make several of the chairs, which are ideal for watching television or just relaxing around the table. Terry cloth is suggested for the covers for the chair cushions, as this material is readily washable.

Except for the stretchers on the chair and the cleats on the table, which are cut from solid stock, $\frac{3}{4}$ -in. plywood is used. This can be exterior-grade, good one side, or hardwood-face plywood. In either case veneer tape is used to conceal edge grain.

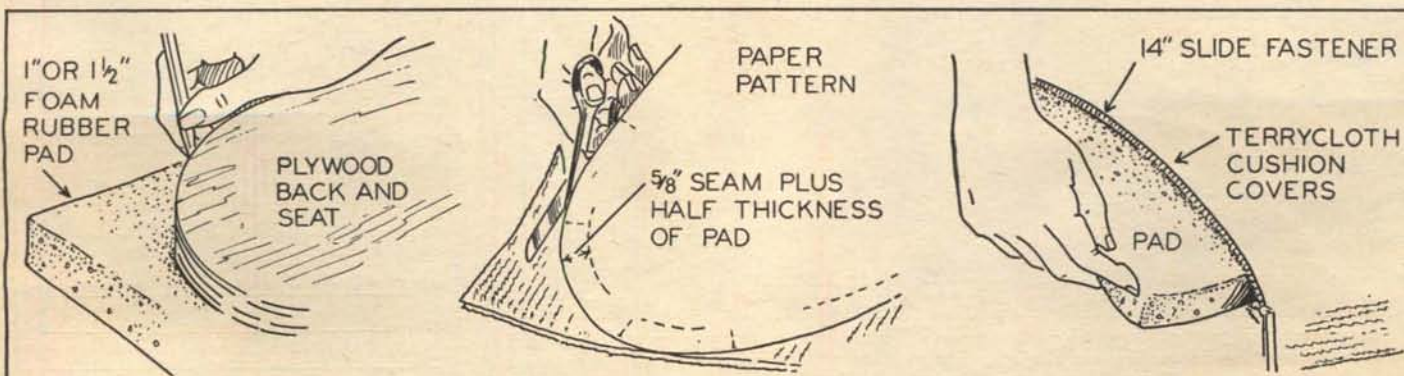
Regular plywood can be stained and finished to almost any color, while the natural color of the hardwood facing on that type plywood will determine the type of finish employed.

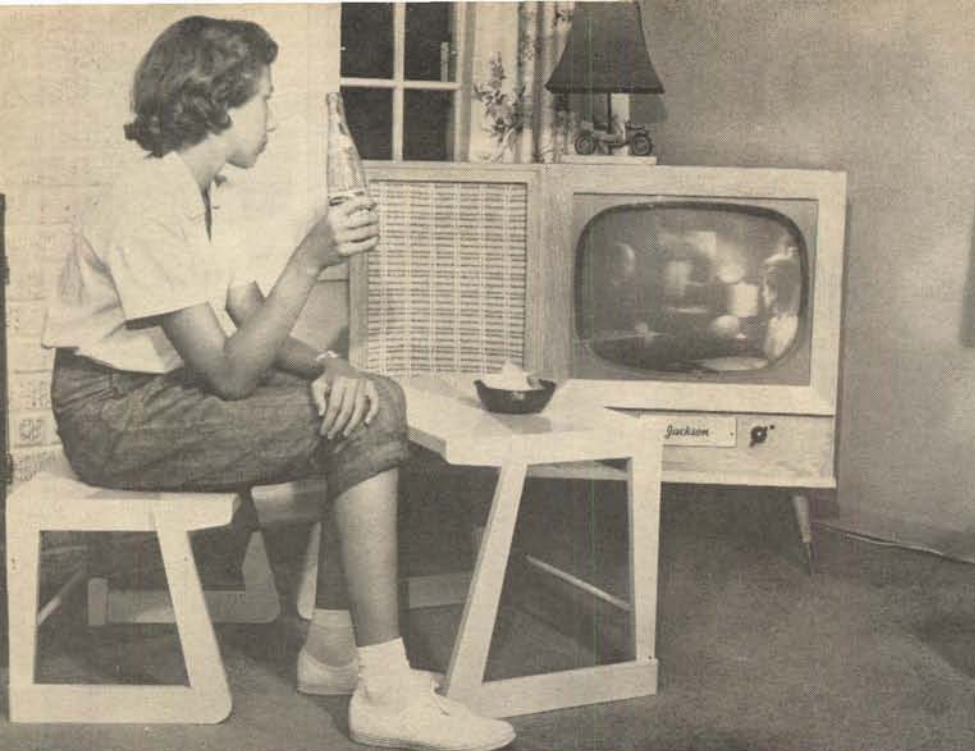
To begin the chair, cut paper patterns, made by enlarging the squared drawings, tape them to the lumber and saw out. Measure the remaining pieces directly on the wood. Assemble base C, D, E, F and square up the edges. Join back A to seat B, then fit this unit on the base with screws and glue. Use glue on all joints throughout construction. To assemble the table, attach legs to cleats D and

E, then join the legs. Now, turn the table tops upside-down and fit the cleats in position. Glue and screw in place when properly located.

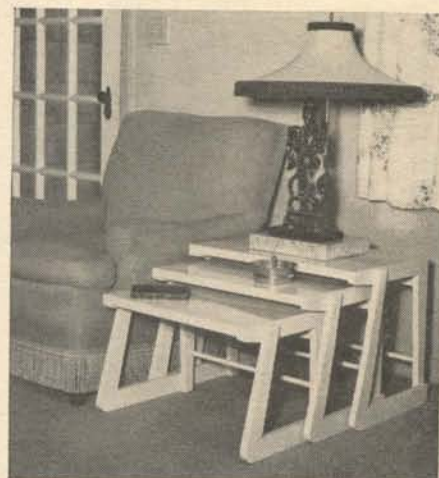
Cushions for the chair are cut from foam rubber or urethane foam. Covers are cut and fitted for the cushions, being made with a slide fastener, as indicated.

Because the coffee table is made in two parts, it can be used as one large table, or two smaller ones. This setup is fine for smaller rooms, permitting division of the table for two groups of people at parties, and using it as one unit for space-saving. $\Delta \Delta$





Left, versatility of nested tables is illustrated by young lady who uses one for a snack table, the other for a seat, while she views TV show. Arranged as below, nested tables form tier of steps for modern appearance. To save space, tables can be nested one above the other.



Nested Tables

Photos courtesy Masonite Corp.

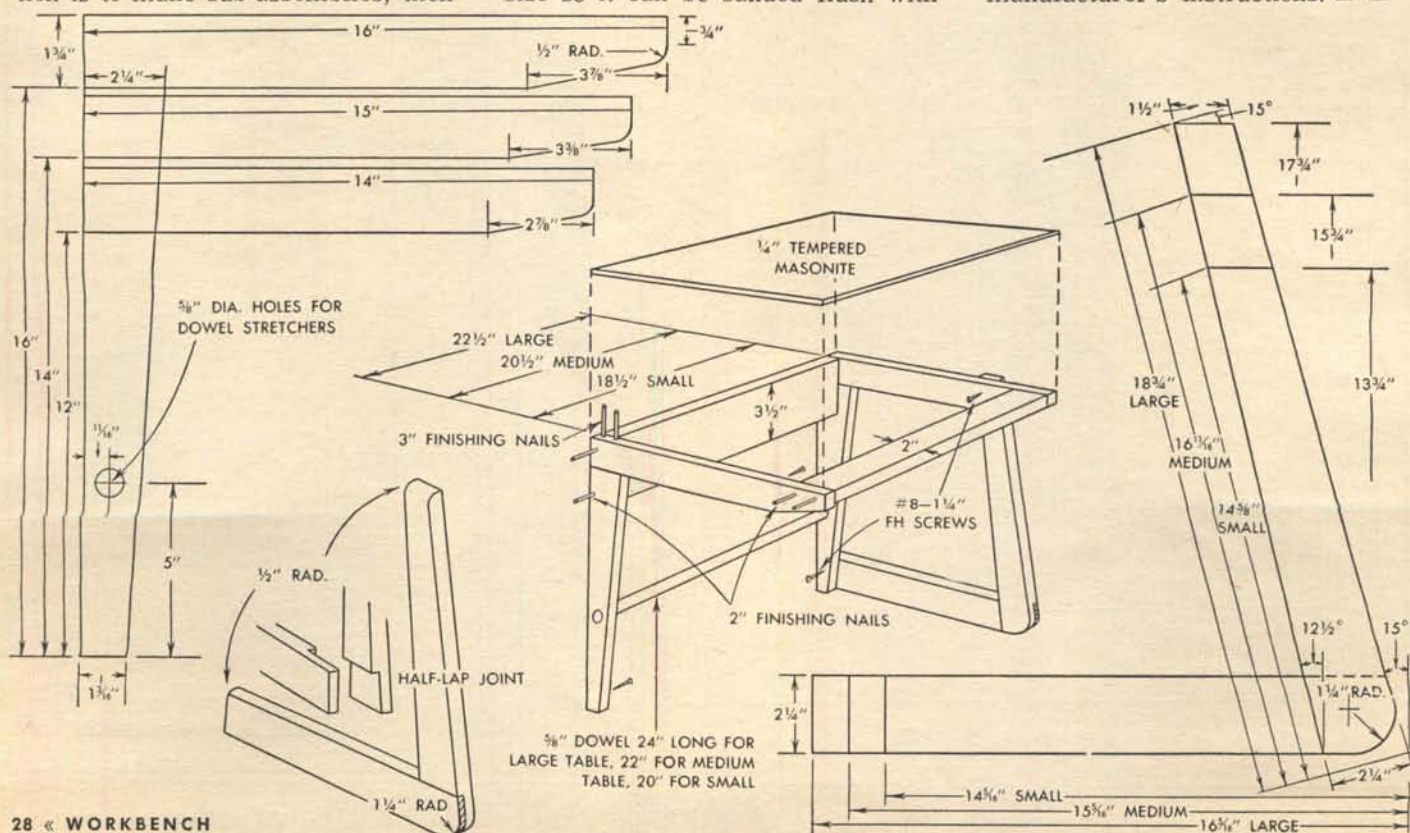
BEAUTY AND UTILITY combine with ease of construction in these nested tables that are from the workshop of furniture designer John Bergen. The tables are versatile enough to double as TV benches, are fine for snacks. When unexpected company drops in, the tables can be located around the room to permit quick serving of informal meals.

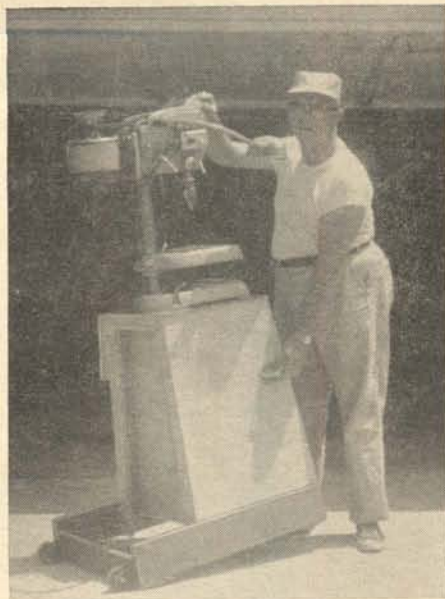
The secret of the simple construction is to make sub-assemblies, then

put these together. Sub-assemblies are the front legs and skids, and the back legs and side rails. Assemble them as shown in the drawing. Now, fit the back-leg-and-rail assemblies to the front and back rails and attach the $\frac{5}{8}$ -in. dowel stretcher that gives each table rigidity. At this point glue on the tops that are cut from $\frac{1}{4}$ -in. hardboard (Masonite Tempered Presdwood). Cut each top $\frac{1}{8}$ in. over-size so it can be sanded flush with

the rails after assembly. Slightly round the exposed edges of the tops. Use a good quality wood glue or contact cement at each joint, as well as screws, to assure maximum strength for the tables.

To finish the tables, use a good quality paint, starting with a prime coat and adding two finish coats. Stain, enamel or lacquer also may be used for finishing. In all cases follow manufacturer's instructions. Δ





The stand is readily moved by lifting on a heavy-duty trunk handle on one side, which causes the casters to contact the floor. Designed for a drill press, stand could be used for other tools.



Cabinet below is for storage of tools, drill bits and accessories too large to fit in handy drawer at upper part of stand. Drawer guides are nailed to inside of cabinet, drawer made to fit.

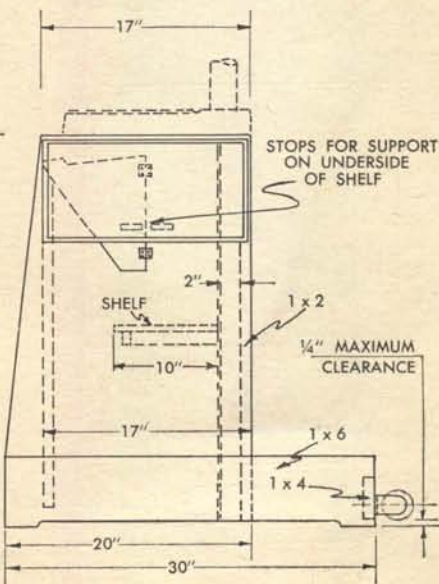
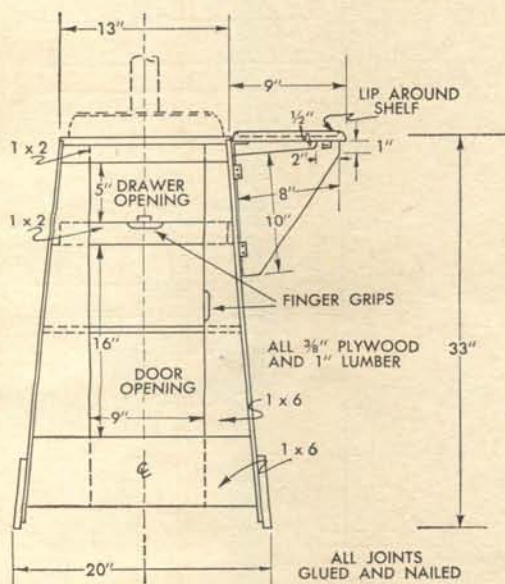
PORTABLE TOOL STAND

HAROLD W. HANMER

MADE OF PLYWOOD AND LUMBER, this stand gives a table-model drill press many of the features of a floor-model unit, plus portability that permits moving it around the shop. Note that there is a 2-in. space between the cabinet back and the 1 x 2 frame-work on the sides. This space permits clamping large workpieces to the stand, or attaching auxiliary tables. A drop-leaf shelf on one side has a lip around it to prevent tools and drill bits from rolling off. Heavy-duty, non-swiveling casters on cross-piece of the extension pieces are posi-

tioned so that lifting on a handle on one side of the cabinet puts the casters in contact with the floor to permit rolling the stand from place to place. A drawer is located at the top of the stand, and a cabinet below that. A finger grip notched in the vertical member, and one in the horizontal member eliminate the need for handles on the door and drawer.

After the support for the drop-leaf shelf is cut to the shape shown and hinged in place, the top, end portion is cut on a level line to support the shelf horizontally. $\Delta \Delta$



CASH FILING SAWS



Make from \$3 to \$6 an hour spare time or start a full time business with the

FOLEY SAW FILER

Here is a steady repeat CASH business you can start at home in your basement or garage, while you are working at your regular job. No experience is necessary to turn out perfect cutting saws—"the first saw I sharpened came out 100%." I think the Foley Saw Filer is a marvel of perfection," writes Clarence E. Parsons. No canvassing—every saw you sharpen will bring you new customers. You will find you can make from \$3 to \$6 an hour—\$20 to \$30 a week in your spare time as a starter. "My spare time saw filing business has made me \$952 these first ten months," says R. T. Chapman.

With the new 1960 model 200 Foley Saw Filer you can file all hand saws, also band and both "combination" (rip and crosscut) and cross cut circular saws. It is easy to operate—simple adjustments—no eyestrain. Patented jointing principle evens up all irregular teeth and makes an old saw cut just like new.

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"MONEY MAKING FACTS" shows you how others have added hundreds or thousands of dollars to their income and how you can develop into a general repair shop that will be your own business. This is a CASH business with a small investment, no overhead, no stock of goods to carry. Time Payments if desired. Mail coupon now for free book and nationwide survey of saw sharpening charges. No salesman will call.

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Minneapolis 18, Minn.

Send me free book "MONEY MAKING FACTS" and Saw Sharpening Price Guide.

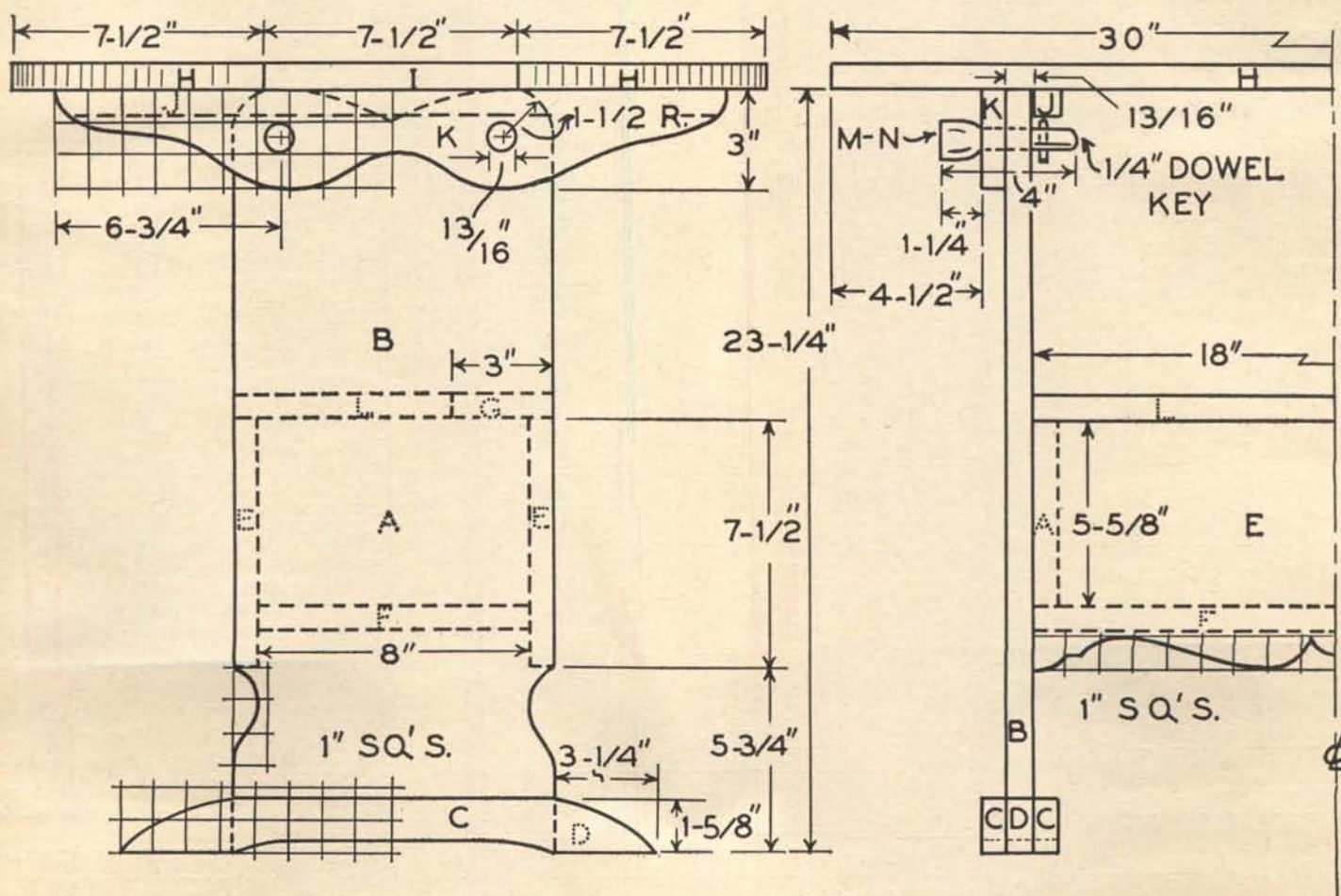
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Scaled-Down

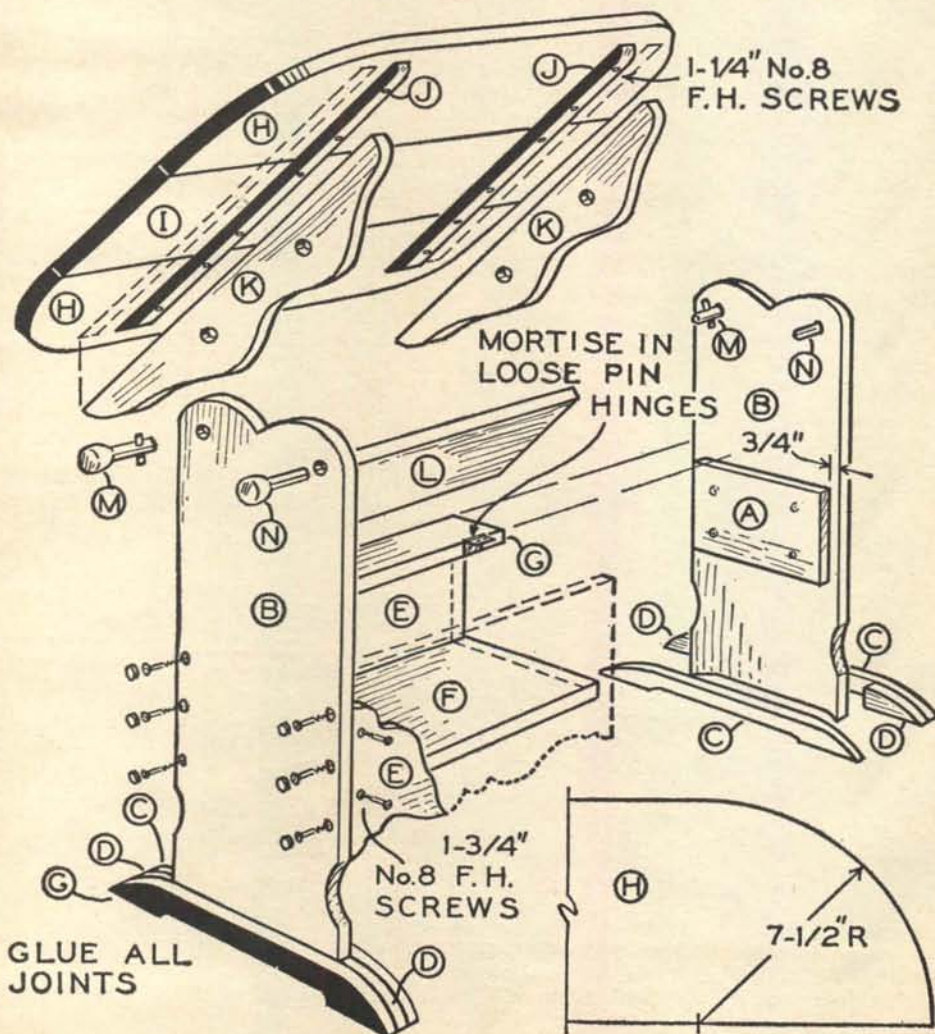
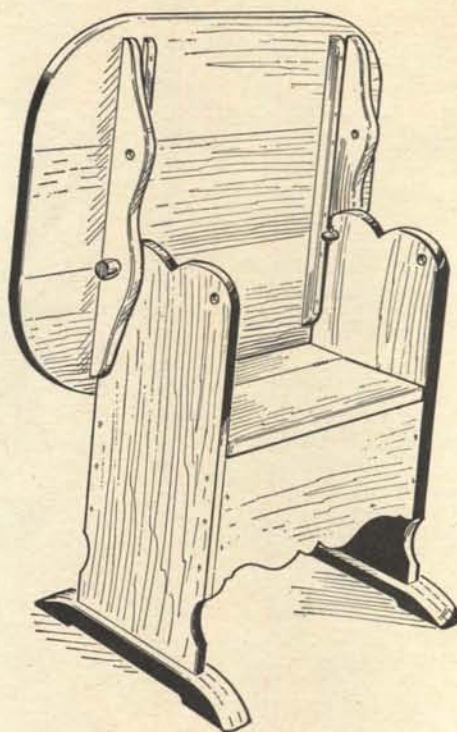
ANTIQUE IN DESIGN, but with many modern functions, this hutch table can be used either indoors or out. As a table it is fine for snacks, refreshments or for a lamp. With the top tilted up, the item is a fine seat for youngsters. Solid stock; white pine, knotty pine or Douglas fir should be used if the hutch will be used only indoors. Use redwood or cypress if the piece will be used outdoors. Suitably faced plywood also could be used for most of the



Hutch Table

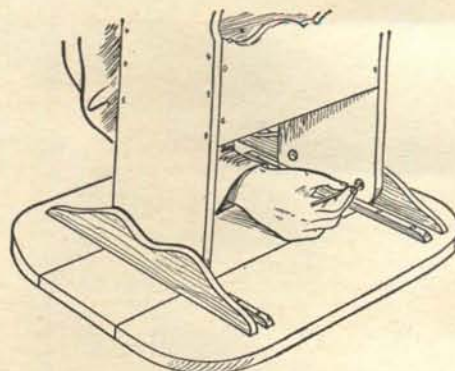
parts to build the hutch, $\frac{3}{4}$ -in. being most suitable.

First step is to make full-size patterns from the squared drawings for the irregular-shape portions. Dimensions and assembly are shown clearly in the drawings. To finish for inside use, brush on a coat of light-brown stain and quickly wipe off. When dry, seal with a coat of spar varnish. For outdoor use, use exterior-grade paint, or let the wood weather a driftwood gray. $\Delta \Delta$



MATERIALS LIST

- A, End blocks, 2 req'd., $5\frac{5}{8}$ " x 8"
- B, Legs, 2 req'd., $9\frac{1}{2}$ " x $23\frac{1}{4}$ "
- C, Feet, 4 req'd., $1\frac{5}{8}$ " x 16"
- D, Filler blocks, 4 req'd., $1\frac{5}{8}$ " x $3\frac{1}{4}$ "
- E, Stretchers, 2 req'd., $7\frac{1}{2}$ " x 18"
- F, Compartment bottom, 1 req'd., 8" x 18"
- G, Back strip, 1 req'd., 3" x 18"
- H, Top boards (edge), 2 req'd., $7\frac{1}{2}$ " x 30"
- I, Top board (center), 1 req'd., $7\frac{1}{2}$ " x 30"
- J, Cleats for top, 2 req'd., $\frac{3}{4}$ " x 20"
- K, Pivot strips, 2 req'd., 3" x 20"
- L, Compartment lid, 1 req'd., $6\frac{1}{2}$ " x 18"
- M, Pivot pins, 2 req'd., 1" dowel, 4" long
- N, Locking pins, 2 req'd., 1" dowel, 4" long



DOES THE SOUND of your wife's vacuum cleaner drown out the sound of the radio or television? Eliminate the noise. When the bathtub or sink runs over is there a rush for mops and sponges to dry the floor? Get rid of them. What do you do instead? Simply plug a 25-ft. length of flexible tubing into a wall receptacle, fit on the proper accessory and go to work, Fig. 1. This built-in vacuum cleaner has the power unit hidden in the basement or a corner of the utility room so the sound does not reach the rest of the house. Liquids are picked up as easily as dry dirt.

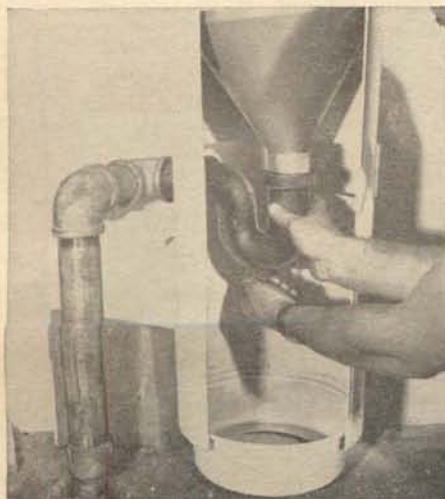
Called the "Aquamatic" the wet or dry vacuum unit can be built into his home by any home craftsman. The unit comes as a kit, complete with the power unit, all accessories for wet or dry cleaning, flexible tubing, rigid tubing, fittings, cement and wall receptacles. The unique double function of the cleaner is made possible by a plastic-reinforced flexible tubing developed by the Flexible Tubing Corp. of Guilford, Conn., for swimming-pool vacuum systems. The tubing also permits quick installation of the unit, Figs. 4, 5, 7, 8 and 10. Installation of the receptacles requires drilling a 2-in. hole in the wall, Fig. 3. Conceal the tubing by going through the wall into the corner of a closet, when going from one floor to another, Fig. 5. Air from the unit is exhausted outdoors, all liquids and dirt are trapped in a water bath, then flushed down the drain, Fig. 2, which helps keep the house clean. Cement is used to make joints vacuum and watertight, Figs. 6 and 7, receptacles not in use are sealed by a rubber gasket, Fig. 9, in the receptacle covers.

Cost of the kit is \$375.00. For more information write to: My Maid Corp., Fort Atkinson, Wis., mentioning that you read this article.

Built-In Wet-or-Dry Vacuum Cleaner



1. This is the easy way to wipe up a floor. When the housewife is finished, there is no tank to empty, no problem with the dirty water. Water and dirt are pulled into the central unit, located in the basement, utility room or other out-of-the-way spot and discharged into the sewer.



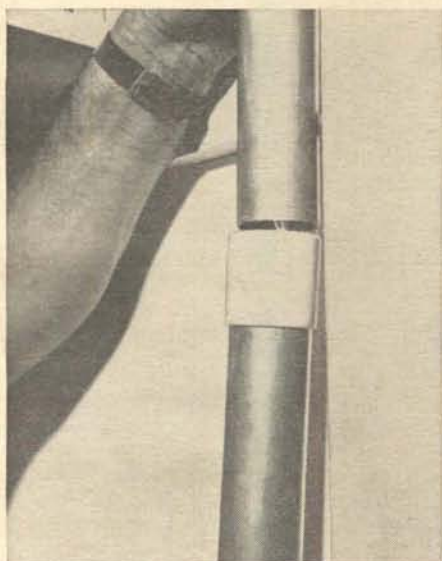
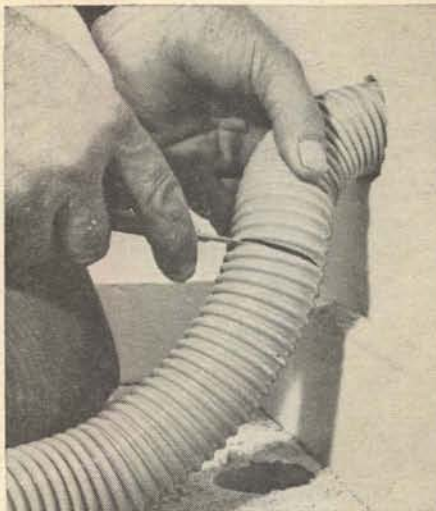
2. Unique water-filter system makes wet or dry pickup possible. Dirt-laden water is dumped into funnel, down the drain. Unit has plumbing-code approval in most cities.



3. My Maid vacuum system is fitted through house like plumbing, because of flexible tubing is installed more like electrical wiring. Tubing is installed by first drilling 2-in. hole at location of receptacle, then running tubing back to the power unit. Two receptacles on first floor, one on second are usually adequate.

4. Once receptacle is located, flexible tubing is pulled through wall, cut with knife to proper length. Wire helix in tubing is cut with pliers. Steel tubing is used for straight runs, as here where line goes directly down through the floor. Flexible tubing eliminates need for most elbows and other fittings.

5. After flexible tubing is cut to length it is slipped over 1 3/4-in. steel tubing. Latter is furnished in 4-ft. lengths, can be cut on the job. Flexible tubing fits snugly on solid tubing.



6. Where lengths of the steel tubing must be joined, slip-on couplings are cemented to the tubing, providing a water and vacuum-tight joint. Enough tubing is supplied in kit for average large two-story home.

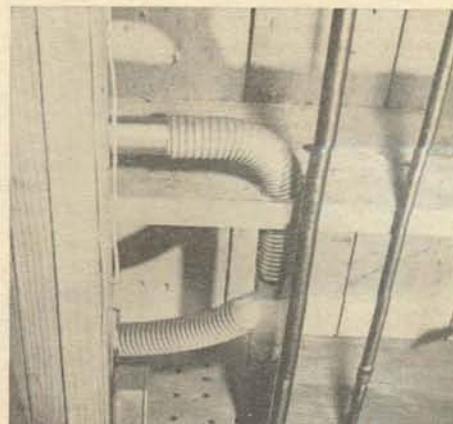
7. Flexible tubing also is cemented to steel tubing. Cement is supplied with the kit, as are all necessary fittings, tubing and supplies. Completeness of kit makes it ideal for do-it-yourself home-improvement project.



8. Receptacle plate, which actually is inlet for connecting lightweight plastic hose to system, is fitted on flexible tubing, cemented firmly. Extra length of tubing permits easy working.



9. Two screws attach the receptacle, or inlet, to a special backing plate that is fitted behind the plaster of the wall. Rubber seal on receptacle lid keeps it vacuum tight when not used.



10. View of underside of floor shows completed vacuum line. Steel tubing runs to right for second-floor connection, flexible tubing runs from plastic Y-fitting to a first-floor connection.



Your Own Two-Way Radio Telephone

LEO G. SANDS



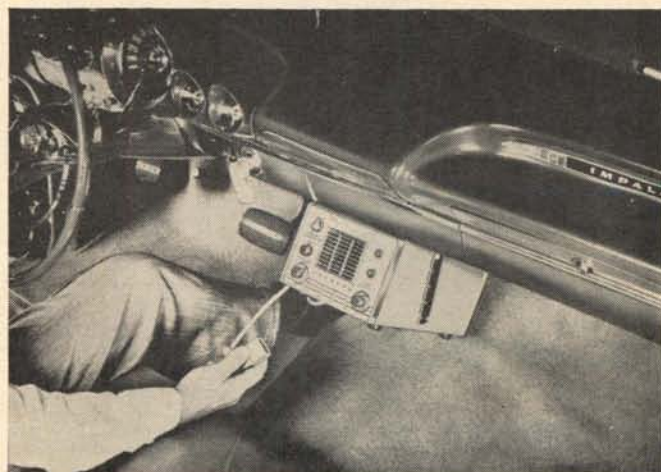
YOU DO NOT NEED TO KNOW MORSE CODE, have a radio operator's license or even have knowledge of electronics to build and use your own Citizen's two-way radio telephone. The same hand tools used to build a kit hi-fi amplifier can be used for assembling a Citizen's Band transceiver. If you don't feel that you want to build a unit, many factory-assembled models are available.

Any U. S. citizen over 18 years of age is eligible for a Citizen's Radio station license, and it can be obtained merely by filling in an application and mailing it to the Federal Communications Commission in Washington, D. C. Proper application forms with complete instructions are included with most Citizen's Band units sold.

The FCC has allocated 23 radio channels in what is known as the 27 megacycle HF (high frequency) band for use by citizens. You can use any

of these frequencies if you have a license. A Citizen's Radio consists of a radio transmitter and receiver, both in the same cabinet. Called transceivers, some of the units are not much larger than a lunch box, Figs. 6 and 11. Factory-assembled units run from about \$60.00 to \$235.00. Kits start around \$40.00 (\$42.95 for the Heathkit CB-1, Figs. 6, 7, 8 and 11), can go to \$98.00 for a unit with a 3-way power supply, such as the International KB-1, Figs. 1 through 5. In addition you will need a mobile antenna, Fig. 10, costing about \$9.00 and up. A fixed antenna, Fig. 9, will cost from about \$7.00 up.

Kits are so easy to assemble that my 8-year-old son already has built two sets. Which kit you should buy depends on what you will do with the radio, and how much time you want to spend building it. The big difference in kits, and in prices, is in the receiver section. Lower-priced units





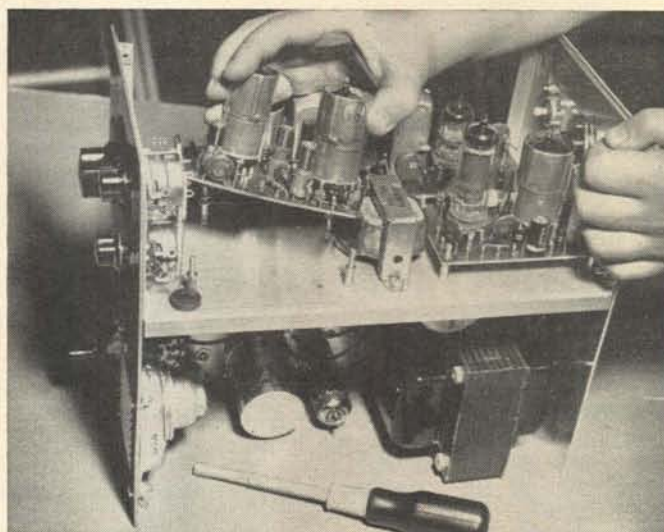
1. After assembling kit manufactured by International Crystal Mfg. Co., it was tested in car. Son Lee used an RME walkie-talkie-type unit to send and receive. Hand-held units give walking citizen a radio.



2. Instructions with most units show how to install them under car instrument panel. Simplest way is to fasten unit on drive-shaft hump as here. This location also keeps set away from maze of wires under panel.

use a superregenerative receiver which is simple and has fairly high sensitivity. The more expensive units contain a superheterodyne receiver in which there are more tubes, and which is even more sensitive, with the added advantage of being more selective. This selectivity makes it less subject to interference from stations on nearby channels. Costlier sets also include such refinements as a squelch circuit and a noise limiter. The squelch circuit eliminates noise normally heard when not receiving a message and when changing channels. A noise limiter silences interference such as that caused by the ignition system of your own and passing cars and trucks.

Regardless of which kit or set you choose all are limited to 5 watts, the FCC-imposed limit. All employ amplitude modulation (AM) and all depend on a quartz crystal for keeping the transmitter on the right frequency. Most sets have an a-c power supply, permitting operation from house current. To use such a set in a car a d-c to a-c inverter must be used. Other sets have internal power supplies so they can be used directly from a car battery, but not from house current. Some kits, such as the International KB-1, Figs. 1 through 5

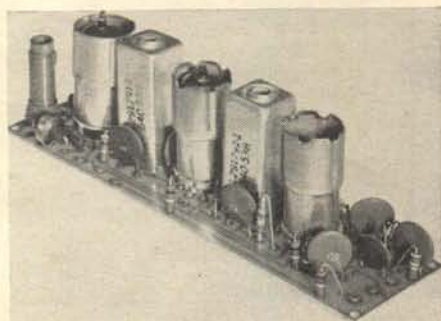


4. Sub-assemblies wired at factory permit quick and easy assembly of the transceiver. Only a few connections between the sub-assemblies are required. If your time is extremely limited, this type is ideal.

are available with a 3-way power supply that allows operating from a 6- or 12-volt car battery or from regular house current.

To use a set at a fixed location you will need a suitable antenna, Fig. 9. (After receiving Mr. Sands' article, the editors obtained kits from the Heath Co. and assembled them. Also obtained was a fixed-station antenna, Fig. 9 and a mobile antenna, Fig. 10.) FCC regulations state that the antenna must not project more than 20 ft. above the roof of the building to which it is attached. The wooden pole or metal pipe or tubing used as a mast is not included with the antenna and has to be obtained locally. The antenna must be connected to the set through a continuous length (no splices) of coaxial cable, usually furnished.

Instructions with the transceivers usually tell how to mount them under the instrument panel of a car. The



3. International kit contains several printed circuits such as this one. Assembly is simplified, cost is greater than kit where builder does work.



5. Lee had no trouble assembling the components, wiring them and soldering connections. All components are easily reached with iron.



6. "When you get to a phone, call Bill Jones. He just got some new power tools he wants you to see. And bring home a loaf of bread."

power cable for a mobile set can be connected to the ammeter and the car body, but there will be less noise interference if the leads of the power cable are connected directly to the battery posts. To avoid trouble, install a fuse in the lead that connects to the "hot" side of the battery.

An antenna for a car would work best if allowed to project straight up. However, for practical reasons an antenna that extends over 9 ft. seldom can be used. Special hardware permits bending the antenna down

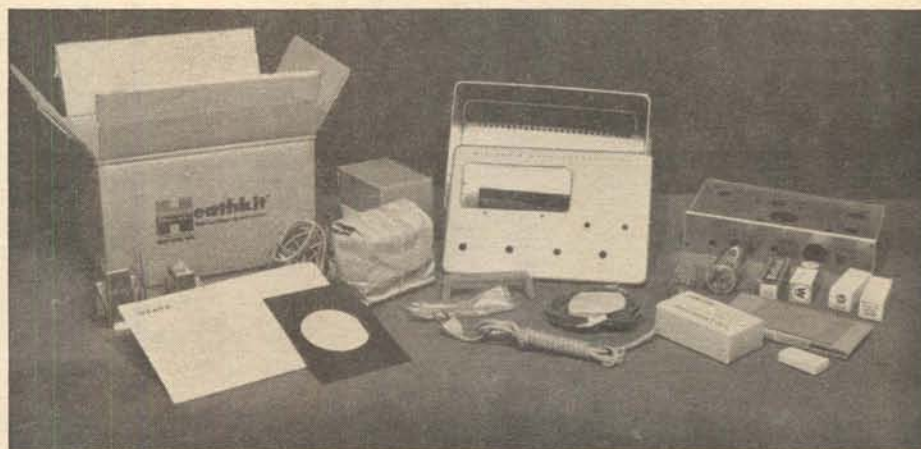
and holding the tip on the gutter of the car roof, Fig. 10. Because the antenna then is partly horizontal, it will produce a directional effect, so that a stronger signal is received when the antenna is at right angles to the signal from the fixed-base station. This usually presents no problem, unless you are caught in heavy traffic. Ordinarily, driving around the block will tell you what direction to face the car to receive the strongest signal. Signal strength only becomes a problem when you are at the extreme range of the transmitter.

Under typical conditions, car-to-house range of a Citizen's Band transceiver is about 5 miles, from car-to-car about a mile or so. Hills, trees and other obstructions will reduce the range.

Under FCC regulations a Citizen's Radio can be used for business purposes—office to truck or car, car to car, etc.—or for personal convenience. However, you must have a reason for going on the air and every call must be addressed to a specific station. You may not engage in promiscuous conversations with strangers. You can contact such strangers in cases of emergency or other special reasons.

Before you go on the air, turn on a radio or TV set to determine whether or not a CONELRAD radio alert exists. This is an FCC rule. If there is an alert, you must stay off the air.

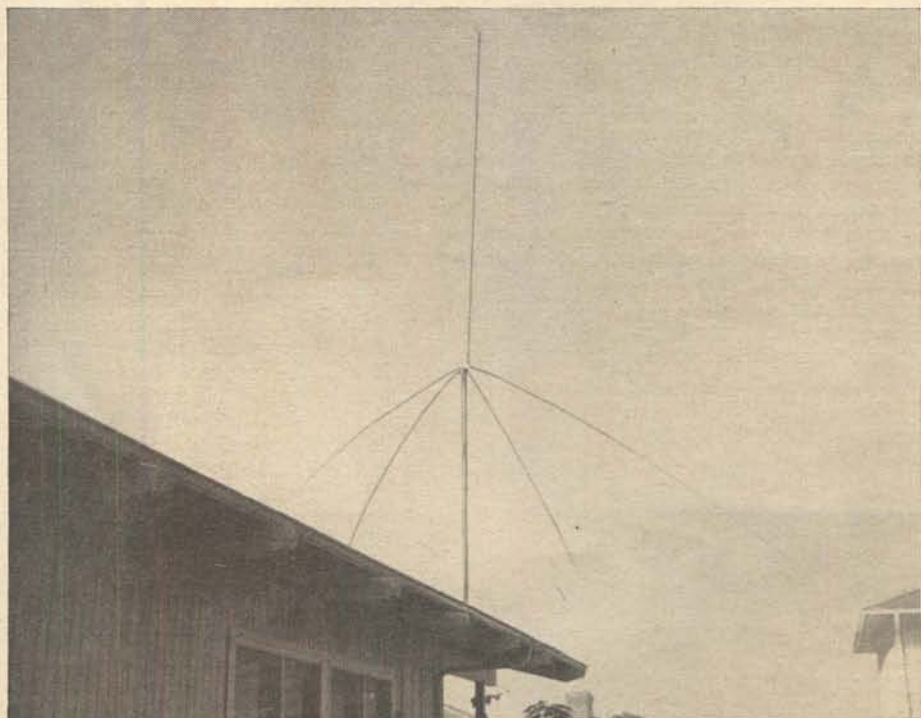
A list of companies that manufacture kits and/or assembled Citizen's Band Transceivers will be found on page 64 in this issue. $\Delta \Delta$



7. After receiving Mr. Sand's article, WORKBENCH editors obtained two Heathkit transceivers and assembled them. All parts for one unit are here, small resistors, capacitors, etc. are in box and bag. Transceiver is extremely light, is easily carried by plastic handle fitted to top.



8. Full-size drawings are easy to follow, each step of assembly is checked off in instruction book when it is completed.



9. Length of 1-in. steel tubing was used for mast for antenna on house. Antenna is not beautiful and your wife must be understanding to accept its addition to house. Higher the antenna, the greater the range for sending and receiving. Must be no more than 20 ft. above roof.



10. Whip antenna for car usually cannot be left in vertical position, must be bent down and attached to car as here. When installing, make sure antenna does not prevent opening of trunk lid, nor block off tail, stoplights.



11. Microphone cord on Heath transceiver is long enough so that even person in back seat can use it, or person standing outside car. "Talk-receive" switch is on set here, some units have switch on microphone.

Filament and Tube Testers



1. Model T-60 tube tester when completed is an attractive, lightweight unit easily carried to the job. It will test all modern tubes used in radios, TV and hi-fi components. It will even handle types such as gas rectifiers.

IF YOU HAVE ELECTRONIC EQUIPMENT, which includes anything from a table-model radio or Citizen's Band transceiver to a hi-fi set or electronic organ, you eventually will have tubes that go bad. Most radio and television circuits are wired in series; that is, if one tube burns out, the complete circuit goes dead. This means that, like testing lamps on strings of old-fashioned Christmas-tree lights, each tube must be checked to determine which one is not functioning. You can call a serviceman, or take the set to a shop. Alternately, you may pull all the tubes and take them to a drugstore tester. The serviceman will cost you money, and there is no assurance that the drugstore tester is completely accurate. Also, there is a good chance of damaging more tubes while carrying them around. The answer to your problem is a tube tester of your own; one that you build yourself will be least expensive.

We obtained two units from the Precision Apparatus Co., (PACO), one a T-5 filament tester, Figs. 3 and 4, the other a T-60 tube tester, Figs. 1 and 2. The inexpensive filament tester we would recommend for the do-it-yourselfer who wants to check radio tubes, and who is interested enough to check radio and TV fuses and circuits for continuity. This pocket-size tester is complete, even to the two dry cells that power it, Fig. 4, and the cells can be checked by the tester itself to determine their condition. It has pin straighteners for 7 and 9-pin tubes, and will test filament-continuity of all radio and TV tubes, as well as pilot lamps.

The tube tester, Figs. 1 and 2, is for the do-it-yourselfer (and serviceman) who has to maintain several pieces of equipment. This unit is powered by 110-volt house current, but the test sections are isolated by a transformer, so that only low voltages are used for testing.



4. Model T-5 filament tester has only a few parts, two dry cells are included to provide power. These dry cells can be tested for condition by the tester itself. Testing capabilities are quite extensive.



2. Complete and accurate step-by-step instructions, as well as oversize drawings permit even an inexperienced teen-ager to assemble the tester with few problems. Only a few hand tools are required for assembly.



3. As with tube tester, filament tester instruction book also contains operating manual. The manual clearly indicates how tests are made.

This assures maximum safety both to the operator and to the equipment. An illuminated 3-window roller chart gives the test specifications of all modern tubes, including special-purpose tubes, such as gas rectifier types and cathode-ray indicators.

While both the filament tester and the tube tester can be purchased already assembled, you can save about one-third the cost by assembling the kits yourself. And, if you have gotten into electronics at all, you will enjoy the task of assembling and wiring the testers. The filament tester is quite simple, with just a few parts, Fig. 4. It was assembled in a short time. The tube tester is more complicated, but the instructions and oversize drawings, Fig. 2, are so complete that anyone can assemble the unit. The efficiency of the testers was quickly proved. A hi-fi set in which the volume intermittently increased and decreased, was determined to have two bad tubes by the filament tester. Replacement of the tubes eliminated the trouble and the set sounded better than ever. A table-model radio was next. This set had a high-pitched whistle when first turned on, plus a continuing hum. The tube tester showed a bad tube; its replacement cured all troubles. Δ Δ

ARMY SHIPS



Photo courtesy U. S. Army

NOT LIKELY EVER to go to sea, Army Sergeant Kendall Middleton still finds pleasure in building models of sailing vessels that sailed the Pacific Coast during the late years of the 19th Century. Hulls of the ship models are carved by hand, and Middleton attempts to keep the models as authentic as possible, down to the placing and shaping of tiny belaying pins. As with almost any hobby pursued with genuine interest, there is profit in building the models. Some of the completed ships have sold for as much as \$175.00.

Snow Thrower

AN UNUSUAL FEATURE of this snow thrower is the scoop that can be swiveled in a 180-deg. arc by means of a crank within easy reach of the operator. The unit is self-propelled, has a 4½ h.p. motor, and will clear a 2-ft. path 65 to 125 ft. long in one minute. It has two forward speeds, one reverse, pneumatic tires with special treads. In operation the auger at the front of the machine turns slowly, feeding the snow into the blower mechanism, where high-speed blades throw the snow as far as 25 ft.

The heavy-duty, recoil starting engine is fully "winterized," designed for easy starting in cold weather. For information write: Sno-Thro, Ariens Co., 279 Calumet St., Brillion, Wis.



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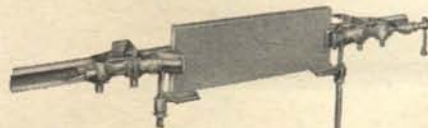
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Grounded Receptacles For Safety



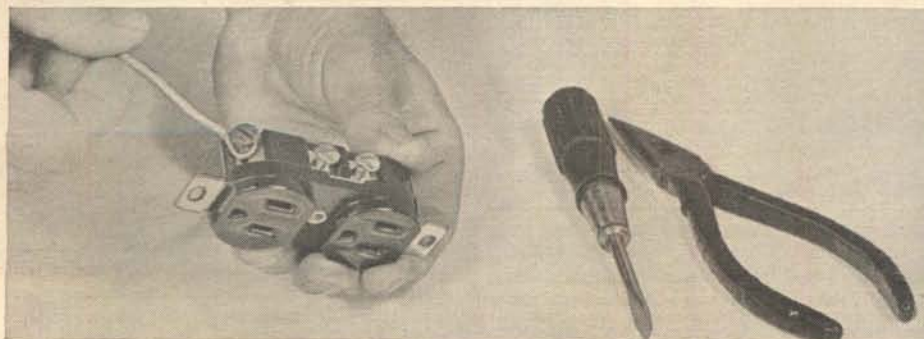
1. Most new power tools, both portable and stationary, now come equipped with special plugs that have a grounding jack. These plugs must be used with 3-way receptacles that are easily installed in place of regular type.



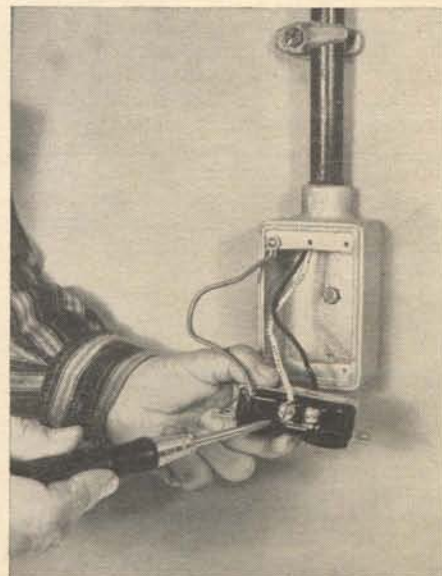
2. Without special receptacle, a grounding adapter must be used. "Pigtail" of adapter should be fastened to cover-plate screw. This seldom is done, and safety factor of ground is lost. Short can kill tool operator.

NEARLY ALL POWER TOOLS manufactured in recent years, Fig. 1, as well as many home appliances, are equipped with a special type of electric plug. It has a round plug jack in addition to the usual two blades. The jack is for the purpose of grounding

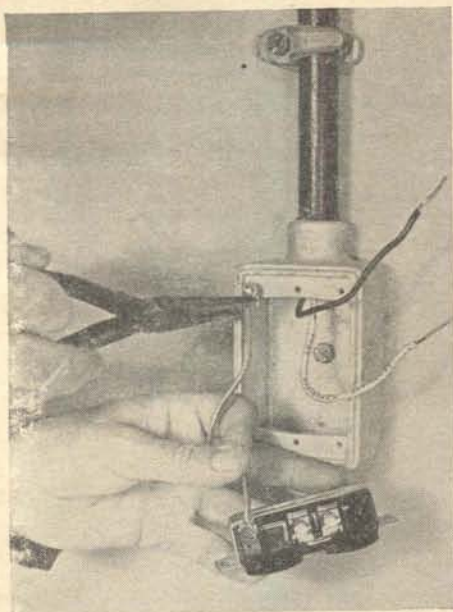
the tool or appliance, so that in the event of a short circuit the current is passed harmlessly to ground, rather than through your body. Although the 3-prong plugs provide assured and automatic grounding, they require a special receptacle. These receptacles



3. Grounding lug on 3-way receptacle usually is painted green, is hex-head screw. Grounding wire is attached to grounding lug, then is run to screw on receptacle box. Grounding wire should be about 6 in. long, so there is enough slack to permit easy working. Extra wire is pushed into box.



4. Regular line wire, black or dark red in color, goes on terminal with brass screw, white wire goes on silver screw. Do not attach ground wire to white wire.

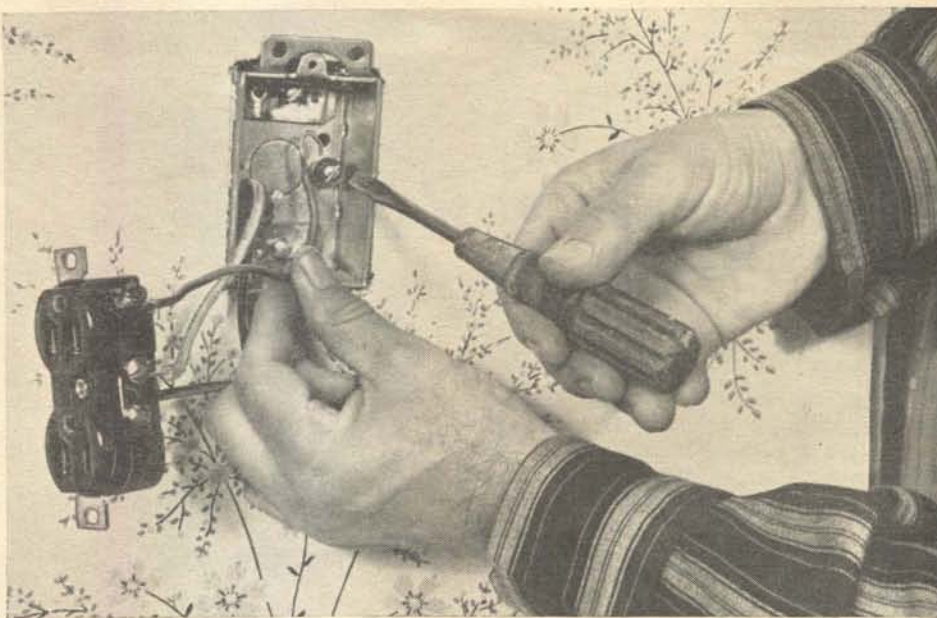


5. Surface-mounted receptable boxes, such as shown, have screw for grounding wire at front of box in recessed surface.

are rarely found in a home workshop, and even less often in other areas of a home. For this reason, adapters are sold to permit using the three-prong plugs in regular receptacles, Fig. 2. Unfortunately, from a safety standpoint, these adapters seldom are used correctly. In the rare instance when the green "pigtail" of the adapter actually is connected to a screw of a receptacle cover, no test is made to determine if the receptacle box itself is really grounded.

The solution of these problems is to install several of the new-type receptacles in your shop and around the house, and to test them for complete grounds while installing them. Figs. 3, 4, 5 and 5A show that installing the special receptacles is no more difficult than replacing any receptacle. The only operation that is different is in the addition of a ground from the receptacle to the receptacle box, Fig. 3. In the case of surface-mounted boxes of the cast-type, Figs. 4, 5 and 6, there usually is a grounding connection to which the ground lead is fastened, Fig. 5. Flush-mounted receptacle boxes in other parts of the home, Fig. 5A, require that a screw be driven in a threaded hole in the back of the box. If there are no threaded holes, a self-tapping screw can be turned in one of the holes.

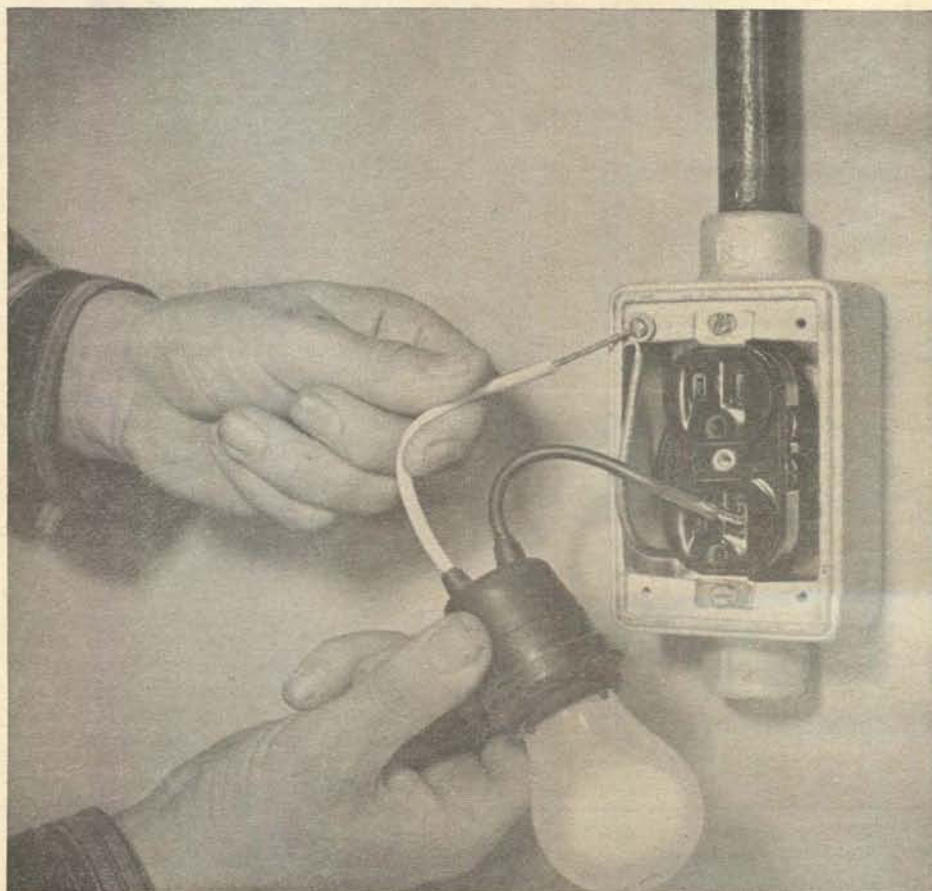
After the new receptacle has been installed, it must be checked to determine if it really is grounded. Fit one terminal of a test lamp on the ground connection, Fig. 6, the other in one slot, then the other. If the lamp does not light with the lead in either of the slots, the receptacle is not grounded. If 2-wire cable with non-metallic sheathing is used, the receptacle box will not be grounded.



5A. Flush-mounted receptacle boxes around the house are different than surface-mounted boxes in the shop. Change of receptacles is made in the same manner, except that grounding wire should be attached to screw in threaded hole in back of box. Self-tapping screw can be used.

This will require running a wire from the box to a nearby water pipe, or back to the fuse box. Fuse boxes always are grounded. When rewiring in your workshop, always use 3-wire cable if it has non-metallic sheathing. Where BX or conduit is used,

this will not be necessary. However, to be sure, always test for ground as in Fig. 6. Also, keep in mind that a short will not seriously affect the efficiency of an electric motor, but without proper grounding, that short can kill you. $\Delta \Delta$



6. If a 2-wire lead is used in cable with non-metallic sheathing, receptacle boxes are not grounded. A third wire must be added if this is the case. To test for ground, touch one lead of test light to ground connection, other lead is fitted in slots. If light goes on, box is grounded.

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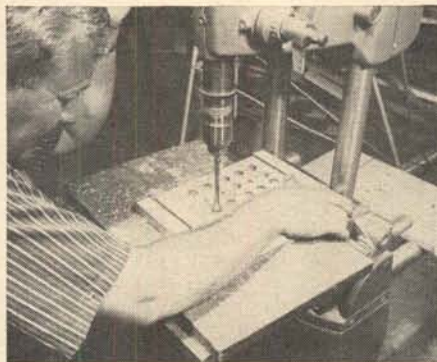
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2. Base of the air box has 3/4-in. holes drilled in it through which air enters cabinet. Note grooves that accept sides of film cabinet.

NEGATIVE STRIPS ARE DRY in just 12 min. with this cabinet that utilizes a hair drier (no heat) as a source of forced air. The cabinet shown is 70 in. high to handle 36-exposure rolls of 35mm film. If you use only 20-exposure rolls, or 120 or 620 film, the cabinet can be shortened to 44 in. Spring-type clothespins hold the upper ends of the film strips, Fig. 1, paper clamps hold the lower ends. The clamps are tied to rubber bands that are tied to lengths of cord. The cords pass through holes in the cabinet bottom, up through holes in the base extension. When the film strips are pulled straight, the cords are wrapped around pegs outside the cabinet. This method of holding the strips under tension is simple, but effective. The cabinet sides are glued and nailed in dadoes in the cabinet base and the bottom of the air box, Fig. 2.

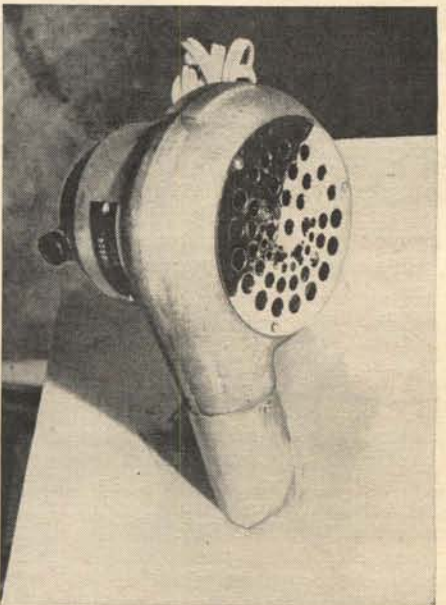
A fan other than a hair drier can be used, as no heat is required. The absence of heat actually is a safety factor, reducing the possibility of fire. If your darkroom is located where dust might be a problem, it is suggested that an open-top extension be fitted above the air box

1. Film is placed in cabinet by slipping one end in top clip, then fitting on bottom clip. Cord for bottom clip is pulled tight, wrapped on peg.



around the blower. A small filter, such as used for an air conditioner then can be fitted over the open top. Air pulled into the blower then would have to pass through the filter, where it would lose much of its dust. A filter holder of the type described was later added to the unit shown.

The finish on the inside and outside of the cabinet should be smooth and easily cleaned, to discourage dust collection. The original was sealed, then painted to match shelves and cabinets in the darkroom. $\Delta \Delta$



3. Looking down on top of air box illustrates how hair drier is fitted in length of tubing that is cemented in air box, sealed in place.

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Shakespeare

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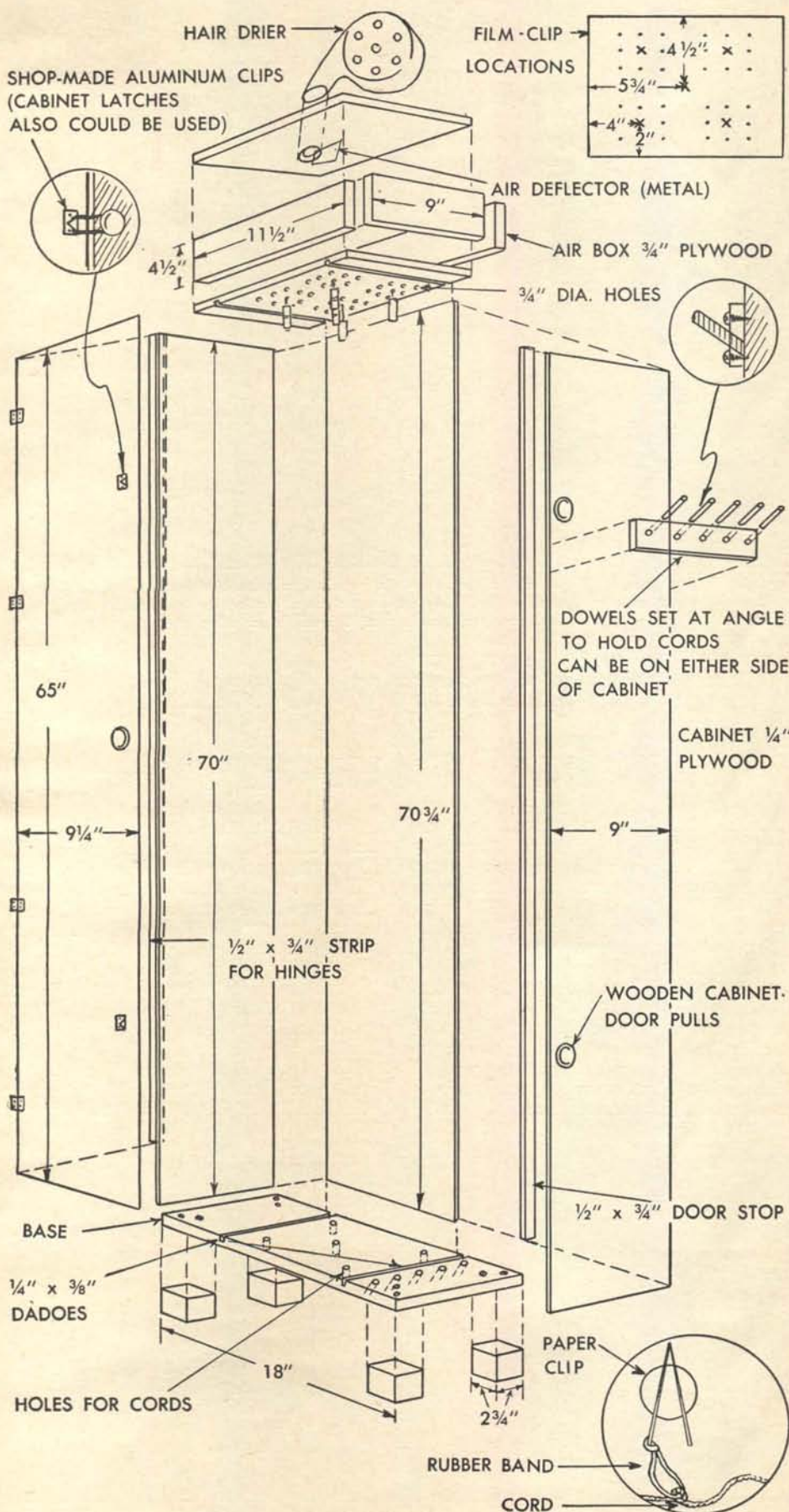
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Before installation of adapter, standard passenger seat in Volkswagen is fine for sitting, but can make no claim to being a lounge. After installation of adapter, seat back will return to this position.



After the Pemco unit is installed, seat back is lowered to the lounging position by lifting up on seat back, pulling lower edge forward. In the lounging position the seat is ideal for catching a cat nap, just relaxing.

Reclining Seats For Your Car



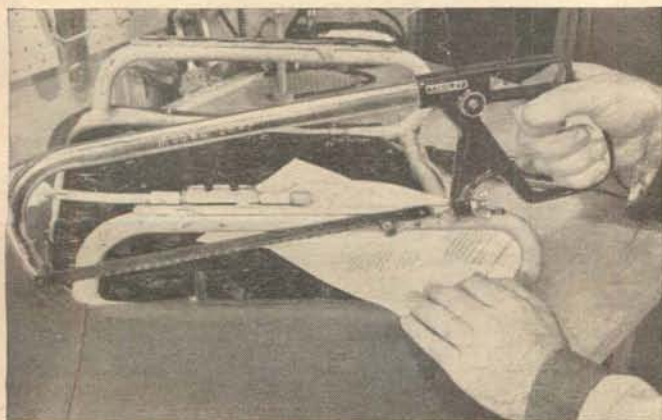
Adapter kit for Volkswagen consists of two metal plates fitted with pivoting arms, four bolts with nuts and lock washers. Installation instructions are simple, clear, well detailed.

INSTALLING LOUNGE-TYPE SEATS in your car is a simple bolt-on, bracket-bending job that takes about an hour with units now available. Adapters can be purchased for Falcons, Comets, Volkswagens and Karman Ghia Volkswagens, as well as for 1958 through 1960 Thunderbirds.

Our installation was made in the Model Shop on a Volkswagen which happened to be handy. While the installation will vary from one car to another, the general principles are the same. First step was to remove the passenger seat and take it to the

Model Shop. The seat back was removed and the pivot pins sawed off. They are used to position the adapter plates on the seat frame, so holes can be drilled for the bolts. It was necessary to slightly bend the frame extensions of the seat back to fit on the adapters, and to clear the bottom of the seat when the back is placed in the reclining position.

The adapters can, of course, be installed only on cars with a split-back front seat. For more information write to: Pemco, Inc., 1425 Jefferson St., Salt Lake City, Utah. Δ Δ



Seat is removed from car and taken to workshop for installation of adapters. First step is to remove seat back, then pivot pins on seat frame are cut off so that only about $\frac{1}{16}$ in. remains to position adapter plates.



Plates are fitted over pin stubs, clamped so holes in plate are on center-line of frame. Holes then are drilled to receive bolts that are provided with kit. After first hole is drilled, bolt is slipped into hole.

WINNERS IN GARDEN CONTEST

HUNDREDS OF PRIZES have been distributed in the last few weeks by FLOWER & GARDEN FOUNDATION to boys and girls who were winners in its first yearly Young America Gardens contest.

Entry blanks were distributed by the Foundation last spring and boys and girls were asked to send a 500-word report on their gardening projects, with snapshots to illustrate them. The eleven top awards in the oldest age group were \$100 college scholarships. In the two younger age groups, prizes were nursery products and items of merchandise donated by nursery and seed firms. All winners have been notified by mail.

Entries disclosed a number of interesting facts about young American gardeners. There was an unexpected interest in vegetable gardening by both boys and girls. Of those who entered the contest, a surprisingly large percentage seemed to live in the country. Other interesting sidelights (perhaps not to be considered surprising) were the consistently high quality of the entries, the intelligent approach the youngsters have made to gardening problems and their practical and scientific ways of carrying out projects. Enormous amounts of time and energy were spent on the gardens, and nearly every entry stated that a bigger and better garden was wanted next year.

The entries proved emphatically that youth and gardens go together.

First-Prize Winners (Scholarships) in the High School Seniors and First-Three-Years College Group:

Ronald Earl Gaumont, Foxboro, Mass.

John E. Burrus, East Stroudsburg, Pa.

Martha Pratt, Wilkesboro, N. C.

Gloria Jean Adams, Fouke, Ark.

Herbert F. Jellum, Starbuck, Minn.

Marlan Ray Graham, Hannibal, Mo.

Merrill Nelson, Phoenix, Ariz.

Deanna Lynne Wrasse, Ansley, Nebr.

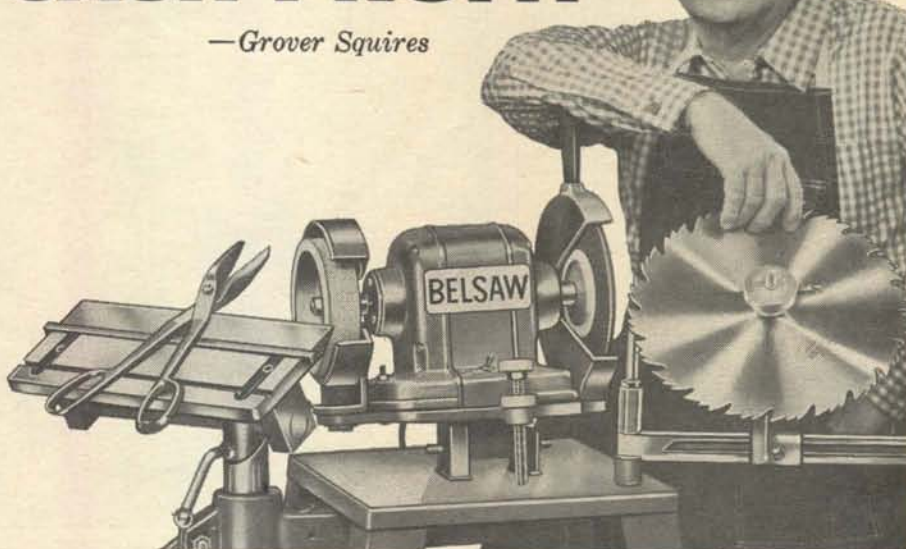
Layne Dearden, Henefer, Utah

Bob Jones, Oakland, Calif.

John Krill, Jr., North Lima, Ohio

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1. The completed carving of the dog, or any project, can be left "as is." However, similar carvings can be given considerable variation by using stains to add character marks, or as an all-over finish. Sanding to produce a smooth finish also changes appearance.

Basic Wood Carving

WILLARD AND ELMA WALTNER

In answer to many requests here is an article on basic wood carving. We know that many readers will want to go on to more advanced work in this fascinating hobby, so the article following this one gives instructions on carving a model of a full-size cigar-store Indian princess. The editors would appreciate any comments you readers wish to make.

WOOD CARVING AS A CRAFT is as old as man himself, yet it is probably one of the first means a modern youngster uses for self-expression. All that are required is a block of wood and a knife. These same simple requirements make wood carving an inexpensive hobby for adults. As you become more interested, there are special chisels and knives that you will need, but basically, any pocket-knife can be used, and on just about any kind of wood. White pine is fine for beginners because of its softness and straight grain.

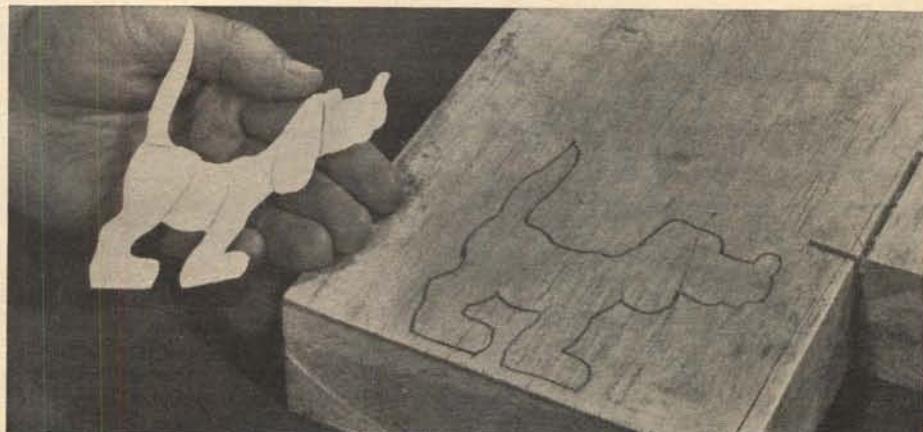
First step in making a carving is to draw a pattern and trace it on a suitable block of wood, Fig. 2. Keep the grain parallel to thin sections of the figure. With some figures, this would be impossible, as with a pointer, where the dog's tail and legs are at

right angles to each other. In some cases, it would be better to carve the tail separately, on a block with the grain the length of the tail, then glue it to the figure. Some extremely hard woods can be carved with thin sections both with and against the grain.

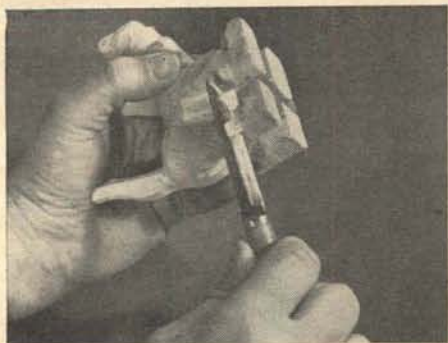
Saw out as much of the figure as possible, to save time, then hold the figure firmly in your left hand (if you are righthanded) and make rough cuts away from yourself, Fig. 3. Make V-notches, cutting at 30 deg. from each side, to remove wood from between paws, ears, legs, etc., Fig. 4.

The thumb-brace grip, Fig. 5, is used for removing smaller amounts of wood and smoothing contours. Your eye is the best judge as to how much material should be removed.

A figure can be left with the natural color of the wood showing, or it may be stained or painted. A rough-hewn look is fine, especially for beginner's projects. The individual carver might want to polish the surface with sandpaper. As with any craft, experience will teach you the best methods, both in carving and applying a finish. Δ Δ



2. Make a pattern of the figure to be carved, then trace the outline on the wood to be used. Note, as here, that the grain should run parallel with the thin sections of the figure. Coping, jig or band saw is used for this first step. Use power tools when possible, to save time.



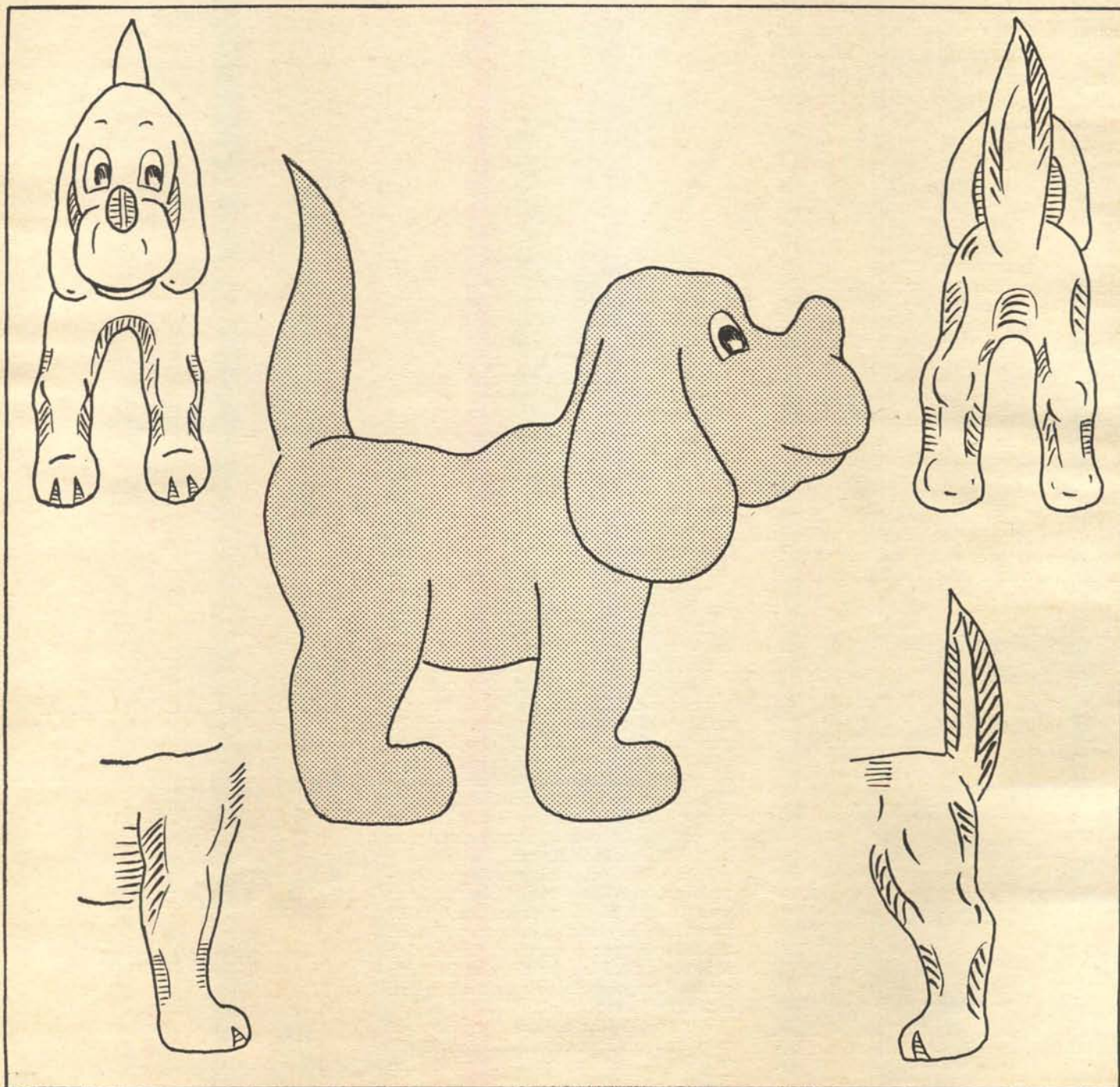
3. After sawing out the figure, remove most of the surplus wood with rough cuts, with the grain and away from the body. Hold the figure firmly.



4. The V-notch is useful for removing wood from between the ears, about the neck and paws. Make opposing cuts at about 30-deg. angle.



5. Thumb-brace grip is used for removing smaller amounts of wood and for smoothing contours as figure nears completion. Be careful.



If carving the dog has been interesting enough for you to want to continue the hobby of wood carving, this Indian princess should prove a challenge. While part of the figure can be rough-sawed to shape, most of it will have to be carved. The right arm and the headdress, in particular, must be carved with care to prevent the wood breaking. It is possible to carve both these features separately, then cement them in place, but a real carver would not even consider this kind of short cut; the figure must be all one piece.

OVER ONE HUNDRED YEARS OLD, the original Indian princess from which this model is copied has spent a full century in the city of North Adams, Mass. She has been in three locations in that city, spending the last fifty years on Main Street in front of the Smoke Shop. Years ago students "kidnapped" the princess, and in doing so broke off her arm and discarded it in a field. Some time later a woman found the arm, recognized it and brought it back to the owners. "Lulu," the name given the princess, was the object of another student prank at a later date, but the youngsters were caught in the act and Lulu stayed home.



Mr. Cooper checks over the completed "Lulu." Knowing the history of the original Indian princess adds interest to the carved model.

Princess Lulu is carved from a single piece of wood, and, as the photos show, her carver took great pains with the smallest details. A cedar block was used for the carving made by Mr. Cooper; any straight-grained wood can be used. The figure can be left the natural color of the wood, but the full-size Lulu has been painted. We cannot be sure the colors are the original used, but the model has a dark-green dress, the stockings, collar and feathers are white. Tips of the feathers are red. The cloak is trimmed in bright yellow, and itself is a dull red. Cigars, tobacco containers and moccasins are dark brown. Flesh tones are reddish-brown, typical of American Indians.

Lulu can be carved with just the use of a good sharp penknife, or carving knife, but it is suggested that a couple of small carving tools be purchased. These tools, designed especially for wood carving, can be purchased at most hobby shops. They will be appreciated especially when carving the face of the princess, as this is the most difficult part of the project. It might be well to practice by carving several faces before you begin the actual figure.

While the original carving is approximately 9 in. high (the pattern was traced directly from an 8 x 10 photo), a beginning carver will find that the larger a carving, the easier it is to work. Fine details can become almost impossible to work on, when a figure is too small.

We would like to see snapshots of carvings of Princess Lulu, and will publish them in our Letters to the Editor Column. △ △



Cigar-Store Indian Princess

JAMES COOPER



Front view of the original princess shows clearly the facial features, headdress, costume, cigars and tobacco in her hands.



Side view shows further details of the costume, shape of the headdress. Careful attention to all details will make model more authentic.



Although right arm is hidden behind display window, all other details of back of Lulu show clearly. Disregard pipe support in body.



1/2" SQS.



HOME-STUDY COURSE On Repairing Household Appliances



1. This housewife is using just a few of the many appliances that are almost standard equipment in many modern homes. Each item will at some time require repairing by an expert serviceman.

EVERY AUTOMATIC APPLIANCE that enters your home, Fig. 1, brings comforts and advantages, but also the sure knowledge that sometime during its life it will require repair or adjustment. Can a do-it-yourselfer do this work himself? Not normally, as many appliances require the use of special tools and test equipment for

2. You can repair only your own appliances, or get into part-time work in the appliance field, or make it a full-time career. Every appliance purchase means another potential job for you.



adjustment or repair. Guarantees usually are voided if an appliance is worked on by anyone but a qualified technician. However, because a do-it-yourselfer already is skilled in many jobs, he can readily pick up the necessary know-how, and learn to use special tools and test equipment.

Realizing that this is true, and also that most do-it-yourselfers are family men with little spare time, the National Technical Schools of Los Angeles, Calif. have developed a condensed version of their full-length Home-Appliance Technician's Course. In a matter of a few months, rather than years, anyone handy with tools—and we know do-it-yourselfers are—can learn not only to repair his own appliances, but those of his neighbors. This means that the course practically pays for itself. In some instances, students have started repairing appliances even before finishing the course, making it a pay-as-you-go proposition.

Test equipment, Fig. 3, is provided as part of the course, and complete instructions are given in its uses, Fig. 4. There now is a shortage of skilled men in the appliance-repair field, and if you wish to use your newly-learned skill to earn extra money, there should be no problem. You can set up a shop in your basement or garage, Figs. 2 and 5, and work only on those appliances you know you can repair, or for which you have room. Larger appliances sometimes can be repaired on the spot, but when such items as automatic washers must be taken back to the shop for major repairs, a fairly large work area is required, as in Fig. 6.



3. This electrical-appliance tester is included in the course, at no extra charge. Other equipment furnished on the same basis includes test light, solder-iron set, screwdriver set and pliers.

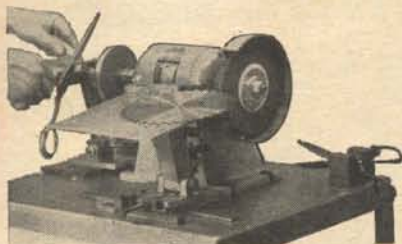


4. The use of a professional tester, plus the proper tools makes repairing of electric appliances quicker, easier and you can guarantee your jobs with complete confidence. Course tells you how.



5. It is possible to "specialize" in the appliance field. For example, you might repair only units the size of room air conditioners and smaller, as illustrated.

Make Money Gain Security with



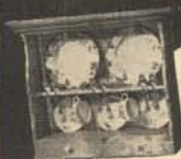
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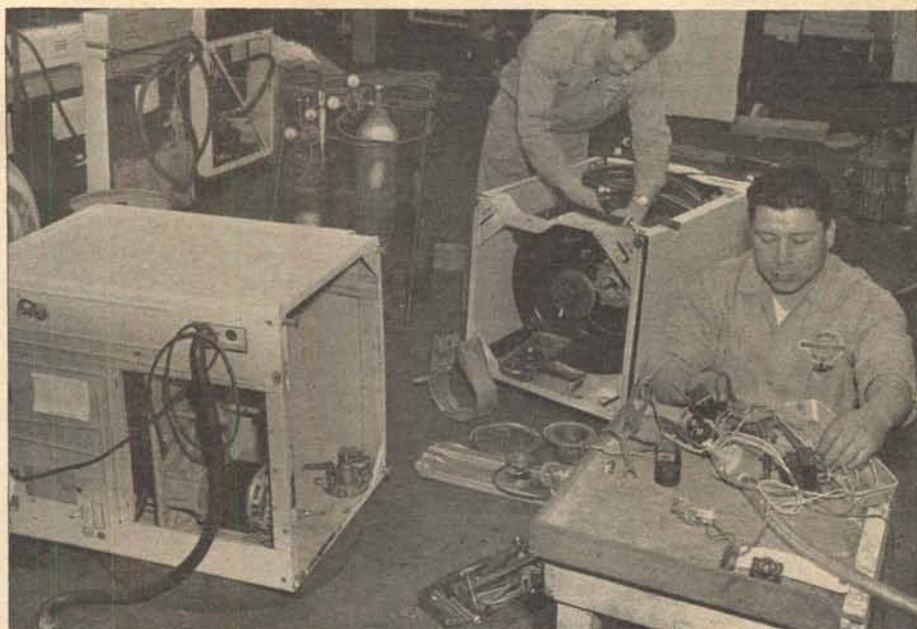
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6. Larger appliances require more working space, different kinds of tools and equipment. Heavier units, such as automatic washers require some brute strength. Note that old auto tires are used under washers as "pads."

To further assure that you would have no problems of space, and to simplify your setup and keep necessary tools to a minimum, you might specialize in just one type of appliance, such as irons, Fig. 7. Should you go into business for yourself, it would be necessary to purchase a stock of repair parts, and specializing in one type of appliance would keep down the cost of such a stock.

Supposing you have problems while taking the course, for which the books seem to have no answer? You can write to the school and a qualified instructor will answer your questions. Help is constantly available.

Basically, however, our interest in

the course was for those readers interested in gaining skill and knowledge to help themselves. Add up the repair bills paid out in a year for appliance repairs. It would not take too many years for the course to pay for itself under those circumstances.

If you are interested in a course on home-appliance repair, we suggest you contact the National Technical Schools, 4000 S. Figueroa St., Los Angeles 37, Calif. Tell them you read of their course in this article, and that you want information specifically on the special short course in appliance repair. National Technical Schools is accredited by the National Home Study Council. Δ Δ

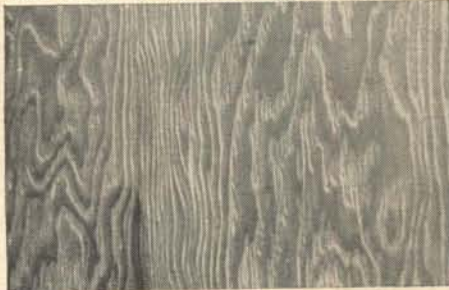


7. Even further "specialization" is possible, as here where serviceman works only on irons. For this kind of repairing it would be necessary to contact a number of retail dealers.

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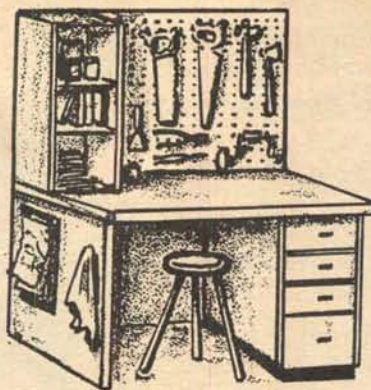
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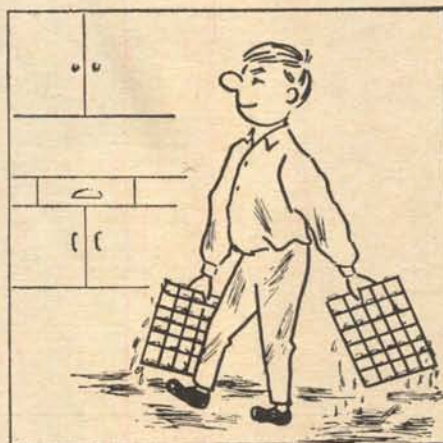
RESEARCH DEPARTMENT

Each issue in this column we will choose questions on home and shop subjects from letters sent to us. Only those questions which have wide appeal will be answered here. Questions on specialized subjects will be answered by individual letter from the Research Editor's desk.

Dear Research Department:

We have three or four wire racks for use on outdoor grills to hold food in place while cooking. While they are very satisfactory when in use, you can imagine that over a period of time they get coated with grease and maybe even a little soot from the open fires. We clean them off after each use, but it is well-nigh impossible to get all this grease off. Which brings up the problem we have and which I told my husband WORKBENCH could solve. How can we store these racks between use without making a big production out of cleaning them, wrapping in newspapers, etc., or hiding them out of reach of the children?

Mrs. F. L., Calif.



Dear Mrs. F. L.:

A friend of ours had a similar experience with these wire cooking racks and he solved it thus: near his permanent outside barbecue grill and on the side of the house he attached a piece of tempered perforated hardboard, about 24" wide by 8" high. He mounted it about an inch away from the wall using small wooden blocks as spacers. This board he painted the color of the house wall (but use trim enamel—not house paint). Final step was to purchase some long brackets used with perforated hardboard. These he placed so that the racks would hang from them—no more muss. He also added a couple of hooks to hold some of his stainless-steel barbecue tools. Hus-

band and wife were very pleased with this solution.

Recently we have had a number of queries seeking answers to some common household maintenance problems. Perhaps we can save some space by answering them together, since solutions are somewhat similar and many of these problems affect all householders. Thanks to R. C., Kan.; Mrs. E. V., La.; P. S., New York; J. L., Ore., for the questions.

What should I do to galvanized metal screens when storing them?

Mix two parts of boiled linseed oil to one part of turpentine. Wipe this on the screens. Let dry before storing to prevent dust from adhering to the screens. This prevents rusting and keeps screens in new condition.

Do you know of any simple way to tighten axe and hammer handles?

Easy. First pound handle on with a sledge, then drive wedge in end. Finally, place hammer or axe head in jar or pan of linseed oil. Let soak for several hours. Remove and wipe off excess. Reason for loosening is that the handle dries out and shrinks. Application of linseed oil should eliminate this problem for some time.



How can I get rid of white marks on a waxed wood surface?

Try this: first rub lightly with alcohol. Let dry. Then rub spots with boiled linseed oil. Wipe off excess.

A similar query: How do I remove white heat marks from walnut?

This is somewhat more complicated but is quite effective. First rub the marred spots with a cloth dampened with essence of peppermint, available at drugstores. When dry apply a light coat of the following mixture: 2 parts raw linseed oil, one part of turpentine. Final step is to let this stand for 30 minutes then rub dry.

Although I realize that there is very little that can be done with brick except to try to keep it clean, is there any finish that I might apply to improve its appearance? Not paint though, please.

We used the following treatment on several fireplaces in homes we have owned, have told neighbors who have tried it—all with success. Perhaps it will also work for you. First clean the bricks—vacuum cleaner, cloth or brush. Then mix two parts of boiled linseed oil with one part of turpentine. Brush or wipe this on the brick surface. Repeat. Let dry for a day or so and rub with cloth to remove excess. This treatment restores the color to the bricks, seems to give a depth to them that has been found very pleasing. Several friends went one step further and wiped on a coat of liquid wax, rubbing it when dry. This produces a dull gloss and of course the wax finish makes it easy to keep the bricks clean.

Final question in this series: is there any effective way to keep snow from sticking on a snow shovel?

Yes, there is. Clean the surface of the metal blade, then coat it with boiled linseed oil. Let it dry before use. You might also wax the shovel; we prefer the former solution.

Now, since you undoubtedly have some linseed oil left out of the gallon, here are several other suggestions for its use, in addition, of course, to its primary purpose of mixing in paint. Use it for softening putty that has hardened in the container. Pour a little boiled oil on the putty and knead it to the consistency you wish. In this connection, before glazing the window, brush some linseed oil on the rabbet of the frame. This will serve to prevent the wood from absorbing the oil in the putty, causing it to dry too rapidly.

If you wish to keep your skis limber, try this: first clean all wax off the bottoms. Then apply a mixture of two parts of boiled linseed oil with one part of turpentine. Let it soak in and repeat. Let the second coat dry at least 48 hours before waxing.

One more tip: before using nails or screws, dip them in linseed oil. Less chance of the nail splitting the wood and the screw can be inserted much more easily. More important, however, is that both nail and screw have a protective coating of the oil against their surfaces. This prohibits to a great extent moisture from travelling down the metal surface to cause rust and eventual loosening. For the same reason, stains are

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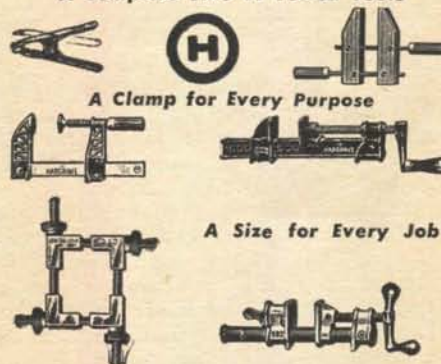
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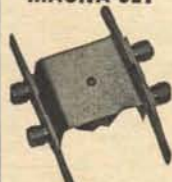
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Dear Research Department:

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D. A., S. Dakota.

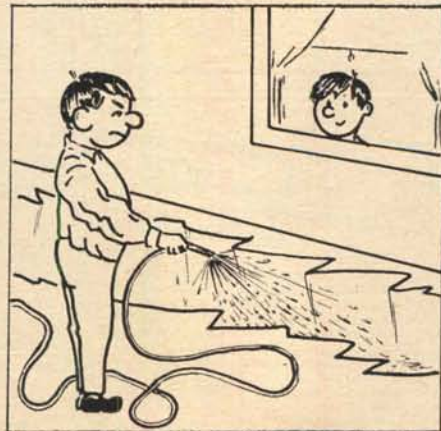
Dear D. A.:

A furnace filter generally is a filmy maze of fibers, coated with oil, through which the air is forced. As this air passes through the filter particles of dust adhere to the filter. This prevents recirculation of dust through the house. In theory, then, clean the filter, reoil it, and you have one similar to new. This is a fine theory but is not a practical possibility. Reasons: unless cleaned with a solvent, dried, and reoiled, air pass-through efficiency with vacuuming is considerably lessened. So in effect, you might as well be operating with a dirty filter. What harm in reduced air flow, you ask? Harm is in the extra strain you put on the motor, and motor bearings cost more than filters. Don't misunderstand our advice, though: as a temporary measure, while a new filter is on order, or if for other reasons it can't be changed for a few days, by all means clean the old one. It will definitely work better than if dirty. The practice of changing is safer and more satisfactory, however, and filters are inexpensive insurance against furnace problems.

Dear Research Department:

Our next door neighbor has a concrete slab patio about 10' x 10'. The house is about four years old. This year the slab settled severely—about 6"—on the side nearest the house wall. Our neighbor then decided to jack it up in place. In the course of doing this, the slab cracked. He kept on with the jacking idea, lifting both sections of the cracked slab. When up where he wanted it, he poked sand and gravel under and washed it in with a hose. Though he seems satisfied, it is already beginning to settle again and all his work seems wasted. This whole procedure does not seem at all satisfactory—what do you suggest doing in a case like this?

J. D., Arkansas.



Dear J. D.:

You're right, J. D., there's got to be a better way! In the first place, this slab settling on the house side may be the tip off that he has other "cheapies" in the house construction, for FHA rules call for a sort of "shelf bracket" made of concrete and cast with the wall to hold such a patio slab as he has. Evidently this was not done in his case. Next point: why should the backfilling wash out so completely? Either it was not properly compacted or it was backfilled when the ground was frozen, which would account for the settling. Anyway, what to do. First would be to determine how much settling has occurred. If it is considerable, the best solution would be to break up the slab, use it for fill, and pour another on top. But if this were done, or another solution which we shall also propose, make sure that there are no drains or downspouts emptying against the house, or this too, could wash out. In a basic way, make sure that all downspouts drain away from the house—and we'll bet that this is a problem all around this house. The other solution to the settled slab problem is ticklish. Although we've seen it done with good results, if not carefully accomplished, you're right back where you started, but a few dollars lighter. Jack up the slab carefully—and we mean carefully—so as not to break the slab. Jack it up higher than you want it by several inches to allow for later settling. When it's up this high, take bags of Portland cement, slash holes in each bag with a knife or shovel, and slide each under the slab. CAUTION: no matter how well you think the slab is propped up, DON'T allow any part of your body under the slab! Poke as much sand as possible in and around the bags of cement. When you have the cavity as full as possible, use a hose and wash as much more sand under as possible. This provides, when it dries, a big solid base for the slab. Inevitable settling should bring it back down to the right level. Even if it stays a little high, that's all to the good, for there will be automatic drainage away from the house.

Research Dept.:

I have a very old wood lathe which originally consisted of the headstock, tailstock and a countershaft. These units were originally designed to be attached to a wooden bed made from 2 x 6-in. stock joined at the ends with spacers and bolts. Do you know the type? Recently I purchased a four-jaw chuck for this machine. The chuck had a 3/4-16 thread and I purchased it thinking it would tighten on the spindle nose which is threaded 11/16-16. But I found that it would not tighten sufficiently to prevent some play, that is, it wobbled slightly. I did not return the chuck as I felt there must be some way to adapt it

to the existing spindle, which, I found, cannot be removed from the headstock (the pulley was forced on) and cannot be replaced. Do you know of any simple way to adapt the chuck to screw tightly onto the spindle?—E.Y., Wis.

Dear Mr. E. Y.:

Yes, we know the type of lathe you describe. It was probably made 40 to 50 years ago, maybe earlier, and, although you did not say, it probably is small, about 6 or 7-in. swing, perhaps. It was driven by a flat belt running on two-step cone pulleys and the headstock spindle turned in plain bearings. Whether or not you can make the chuck work satisfactorily will have to be determined. You did not describe the chuck or say whether or not it is fitted with a separate backing plate or whether the threads are not tapped directly into the chuck body. If the chuck is of the type fitted with a separate backing plate which is attached to the chuck body with capscrews, then it would be a simple matter to have a machinist make you a special plate and thread it to fit the 11/16-16 thread spindle. If, on the other hand, the threads are tapped directly into the chuck body, the problem of adapting it to the lathe spindle becomes more difficult. One way is to try wrapping a very fine soft-brass wire in the bottom of the spindle thread. Inasmuch as the chuck and spindle threads are of the same number per inch this may do the trick if you can determine the correct wire size that will permit the chuck to turn onto the spindle thread without binding or "freezing." This will take a bit of experimenting with fine wire to determine the correct size. We suggest that you try this procedure, but we would caution you to use extra care in turning the chuck onto the spindle over the wire. If you exert a little too much pressure and the chuck jams, you may have real trouble getting it off without damaging the spindle.



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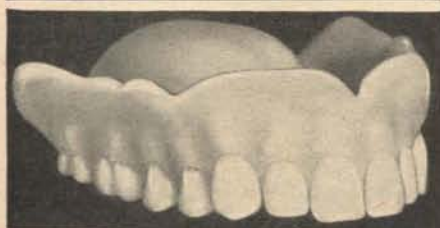
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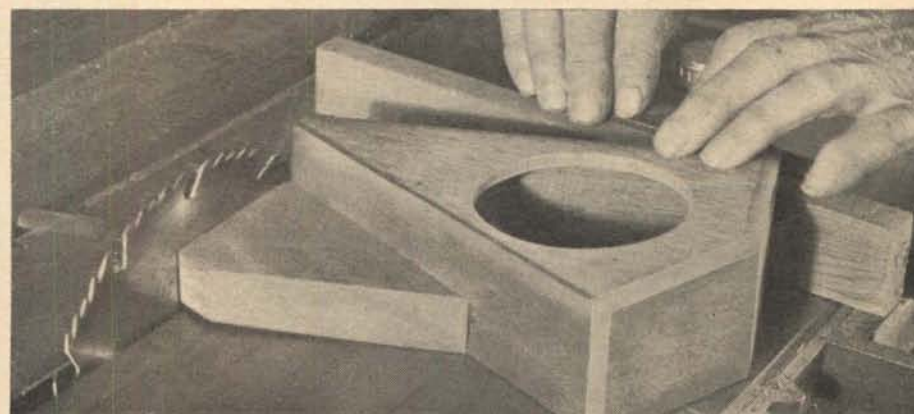
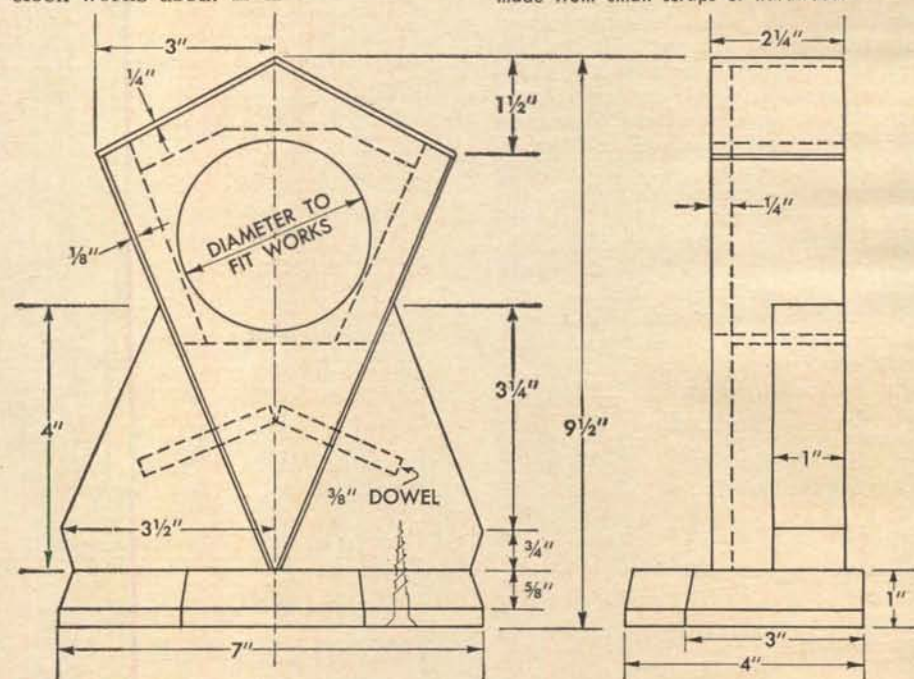
Clock Cases From Scraps

D. C. MARSHALL

SCRAPS OF HARDWOOD of various kinds and colors, the kind that seem to collect in every woodworker's shop, were used to make this attractive clock case. The clock works were salvaged from a damaged plastic case. Clock works also can be purchased from companies selling craft supplies. The case itself was cut from 1/4-in. stock, being reinforced by 1-in. material used for the base and ribs. On the original, 3/8-in. dowels were used to add rigidity between the heavier and lighter woods. Blocks are inserted inside the case to position the works, their size and location being determined by the particular clock works used. △ △

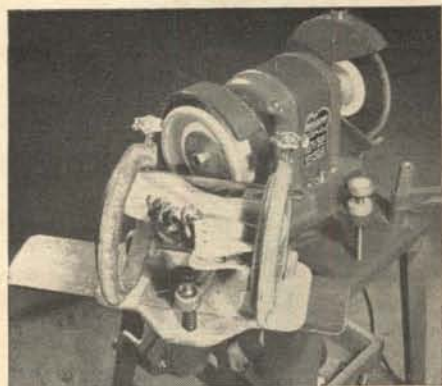


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2. The owner is: Modern Handcraft, Inc., 543 Westport Rd., Kansas City 11, Mo.; John E. Tillotson II, 543 Westport Rd., Kansas City 11, Mo.; John E. Tillotson, 543 Westport Rd., Kansas City 11, Mo.; C. S. Tillotson, 543 Westport Rd., Kansas City 11, Mo.; Mary Ida Sullivan, 543 Westport Rd., Kansas City 11, Mo.; Wilburn L. Mead, 543 Westport Rd., Kansas City 11, Mo.; Sarah Peery, 543 Westport Rd., Kansas City 11, Mo.; Flower & Garden Foundation, 2318 W. 95th St., Kansas City 15, Mo.

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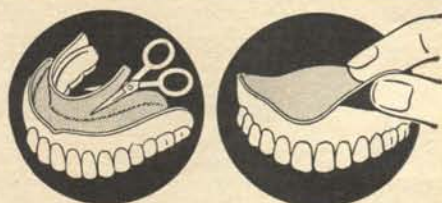
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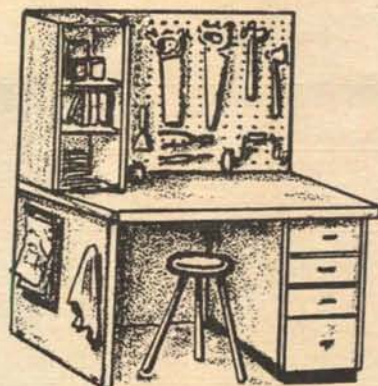
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Before starting a painting job, if you are expecting telephone calls, wrap the phone with a couple of pieces of facial tissue and hold them with a rubber band. This will eliminate the need for cleaning paint smears from the phone. This idea works well for the lady of the house too, if she starts a baking spree that will require flour-smeared hands.

Wayne Floyd, Fayetteville, Tenn.

Spillproof Oil Can



Oil cans carried in toolboxes invariably tip over and spill all over the tools. Avoid this by using a lighter-fluid container of the type with a spout that pours when pointed straight up, is sealed when tipped to either side. Pry off the spout, fill the can with oil and replace the spout.

Ned Charles, Kansas City, Mo.

Cabinetmaking Tip

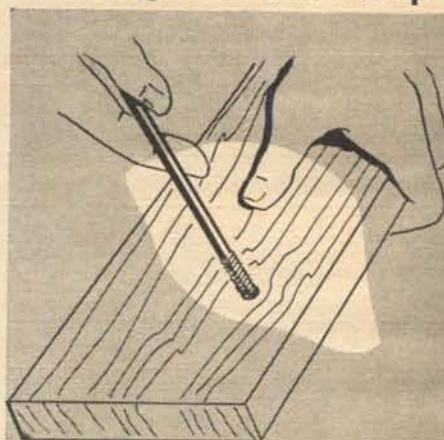
To fasten drawer cleats, runners, anti-tilt devices and the like in locations where it is difficult to reach to nail or drive screws, try this stunt: Coat the area, and the item with con-

WORKBENCH SHOP TIPS

tact cement. Allow the cement to dry the proper length of time, then press the item in place. It will stay in position with no need for clamping or other holding device.

Floyd M. Miller, Jamestown, N. Y.

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Need to enlarge a hole bored in wood, but no file or rasp is handy? Then use a carriage bolt as indicated, the threads of the bolt providing the cutting surface.

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Bil Toman, Palatine, Ill.

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Wayne Floyd, Fayetteville, Tenn.

Cap for Calking Gun

After you finish a calking job and there's still some compound left in the gun, cap the end of the nozzle with a finger cut from an old rubber glove. Secure the finger in place with a rubber band. This will keep the compound from drying out and plugging the nozzle.
John A. Comstock, Wellsboro, Penna.

Wrench for Screw Eyes



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Bil Toman, Palatine, Ill.

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Manufacturers' Directory

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Belsaw Power Tool, Belsaw Power Tool Co., 969 Field Bldg., Kansas City, Mo.

DeWalt Power Shop, DeWalt, Inc., Lancaster, Pa.

SawSmith and ShopSmith, Yuba Products, 800 Evans St., Cincinnati 4, Ohio

Planes Work For You, Page 20

Surform Tools, The Stanley Works, 195 Lake St., New Britain, Conn.

Nested Tables, Page 28

Masonite Tempered Presdwood, Masonite Corporation, General Office: 111 W.

Washington, Chicago 2, Ill.

Built-In Wet-or-Dry Vacuum Cleaner, Page 32

Plastic-reinforced Flexible Tubing, Flexible Tubing Corp., Guilford, Conn.

My Maid Aquamatic Built-in Home Cleaner, My Maid Corp., Fort Atkinson,

Wisconsin

Your Own Two-Way Radio Telephone, Page 34

Citizen's Radio and/or Kits

Heath Co. (Heathkits) Benton Harbor, Mich.

International Crystal Mfg. Co., 18 N. Lee, Oklahoma City, Okla.

Lafayette Radio Electronics Corp., 165-08 Liberty, Jamaica 33, New York

Vocaline Co. of America, Old Saybrook, Conn.

Jetronic Industries, Inc., 4000 N.W. 28, Miami, Fla.

Gonset Div., Young Spring & Wire Corp., 801 S. Main St., Burbank, Calif.

E. F. Johnson, Waseca, Minn.

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Burnstein-Applebee Co., 1012-14 McGee St., Kansas City 6, Mo.

Dynaco, 617 N. 41st, Philadelphia 4, Pa.

Electronic Instrument Co. (Eico), 33-00 Northern Blvd., Long Island City 1,

N. Y.

Electro-Voice, Buchanan, Mich.

Paco Electronics Co., 70-31 84th St., Glendale 27, Long Island, N. Y.

Radio Shack Corp., 730 Commonwealth Ave., Boston 17, Mass.

Filament and Tube Testers, Page 38

Paco Electronics, Inc., Division of PRECISION Apparatus Co., Inc., 70-31 84th

St., Glendale 27, Long Island, N. Y.

Snow Thrower, Page 39

Sno Thro, Ariens Co., 279 Calumet St., Brillion, Wisc.

Reclining Seats For Your Car, Page 44

Seat Adapter, Pemco Inc., 1425 Jefferson St., Salt Lake City, Utah

Home-Study Course on Repairing Household Appliances, Page 50

Home Appliance Repair Course, National Technical Schools, 400 S. Figueroa

St., Los Angeles 37, Calif.

Ice-Skate Sharpener, Page 59

Belsaw Ice-Skate Attachment, Belsaw Power Tool Co., 969 Field Bldg., Kansas

City, Mo.

Electric Convertible, Page 64

Electric Car, Electric Car Co. of California, Inc., 495 Alamitos Ave., Long

Beach 12, Calif.

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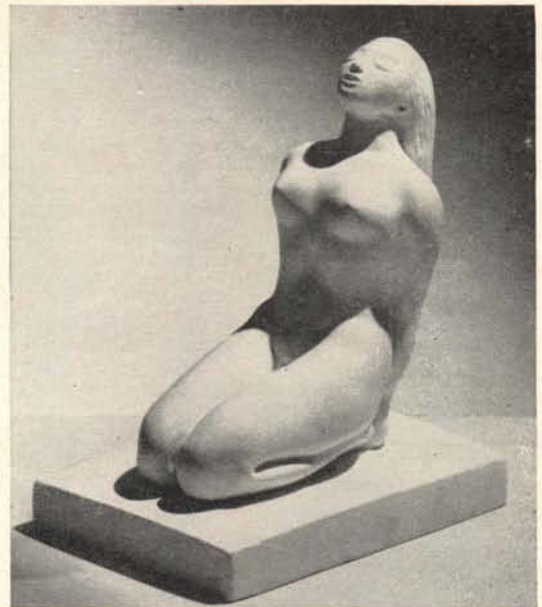
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